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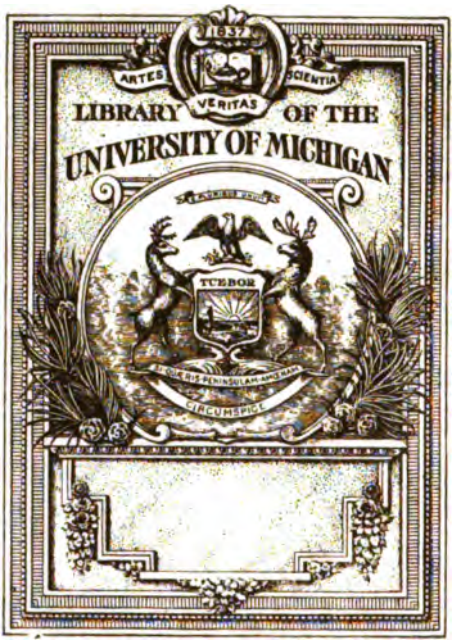
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THE CAPITOL AT SANTA FE.

REPORT

OF THE

GOVERNOR OF NEW MEXICO

TO THE

SECRETARY OF THE INTERIOR.

1903.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1903.

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REPORT

OF THE

GOVERNOR OF NEW MEXICO.

EXECUTIVE OFFICE,
Santa Fe, N. Mex., September 15, 1903.

SIR: In obedience to your request, I have the honor to transmit herewith my annual report on the present status, as well as the progress and development, of the Territory of New Mexico, for the fiscal year ending June 30, 1903.

For convenience of reference, the report is divided into four parts:

Part I, reviewing briefly general conditions and events since the last annual report and presenting specifically the status of each county, city, and town.

Part II consists of articles on special features of the industrial development and growth of the Territory, as well as chapters on population, railroads, agriculture, irrigation, mining, stock raising, geology of the Territory, the cliff dwellings, etc.

Part III includes the reports or abstracts of the annual reports of the United States officials in the Territory.

Part IV is devoted to the reports of the Territorial officials and the boards of public institutions, administrative, educational, and charitable, as well as financial.

In conclusion there is a concise résumé of the facts and figures presented by these reports. In accordance with your request, many of the reports given at length in former years are treated more concisely, and care has been taken to prevent the duplication of matter so as to keep the report from being unnecessarily bulky.

I have the honor to be, sir, your very obedient servant,

MIGUEL A. OTERO,
Governor of New Mexico.

The SECRETARY OF THE INTERIOR,
Washington, D. C.

6819—03——1

PART I.

REVIEW OF THE PAST FISCAL YEAR.

The fiscal year which ended on June 30, 1903, was one of quiet growth and general prosperity for New Mexico. The building of railroads continued with unabated vigor and capital not only sought but made extensive investments. Good crops, a heavy wool clip, an auspicious winter for herds and flocks, continued activity in mining, an abundance of water for irrigation, the development of new coal mines, and a share of the general prosperity which has prevailed throughout the country at large, and is still prevailing, have contributed to the good times and the feeling of contentment that exists in New Mexico at the present writing. The consciousness that New Mexico is growing in wealth and population, that its resources are permanent, are giving stability and are encouraging enterprise in every direction. The finances of the Territory are in excellent condition, and so are those of the counties and cities, with a few exceptions caused by loose methods many years ago and the results of which methods the counties affected are making every effort to overcome. The Territory, as well as most of the counties, is reducing its indebtedness, while several counties are refunding their indebtedness at a lower rate of interest. The assessed valuation of New Mexico shows an increase of about $1,000,000 over that of the preceding year, which is the more significant, as the average assessment rate prevailing throughout the Territory is only about 20 per cent of the real value, and the actual increase of taxable valuation, owing to the elimination of double assessments reported in former years, is almost $3,000,000. Tax collections for the past six months by the Territory exceeded those of the same period of the previous year by about $50,000.

The Territory has been spared great calamities by storm, flood, or other agencies, excepting in a few restricted areas, the greatest disaster of the past year having been a freshet in the Mimbres Valley, which devastated a fertile agricultural section and swept away the crops that had been garnered. Aid was quickly extended and all suffering was speedily and generously relieved.

This spring high water in the Rio Grande Valley caused some damage to growing crops but no lives were lost. It is certain that the construction of storage reservoirs would turn these perennial floods into agents of extensive usefulness instead of being the means of loss and destruction. Unfortunately, the cost of the construction of such reservoirs is so great and the financial returns would probably be so slow, although certain, that private investors, excepting under the most favorable conditions, are loath to take hold of the storage reservoir and irrigation propositions, which are offered in every river valley of the Territory, and which would add to the reclaimed area of New Mexico many thousand acres. It is therefore a matter of great satisfaction in this Territory that the National Government has at last

embarked upon a policy that will ultimately vastly enlarge the agricultural area of the arid West.

The visit of President Roosevelt to New Mexico early in May this year, on his way to the Pacific coast, was a matter of great pride and gratification to the citizens of New Mexico. At Santa Fe and Albuquerque where the Presidential party made stops of several hours, elaborate preparations were made for the reception, and the warm enthusiasm with which the Chief Executive of the Nation was greeted as well as the memorable words he spoke at both places, have made the occasion historic and a pleasant memory to everyone of the many thousands who greeted the President in those two cities.

The legislature which met in January, in sixty days' session, in the main passed wise, beneficent, and progressive legislation affecting the public schools, the building of good roads, the maintenance of the Territory's penal, educational, and charitable institutions, the regulation of water and irrigation rights, and the encouragement of industrial enterprises. It created the office of traveling auditor and bank examiner, and of Territorial game warden, provided for the compilation and publication of the Territory's excellent school laws, created the new counties of Roosevelt, Quay, Sandoval, and Torrance, the latter to be established on January 1, 1905; changed the boundaries of Guadalupe County and its name to Leonard Wood County; took one precinct from Santa Fe County and added it to Rio Arriba County; and added a small portion of southwestern Socorro County to Otero County. It provided for the establishment of an asylum for the blind at Alamogordo, of a miners' hospital at Raton, a reform school at El Rito, and an orphans' home at Belen; it appropriated $30,000 for a New Mexico exhibit at the Louisiana Purchase Exposition at St. Louis next year, and provided the means for the completion of the fine new school for the deaf and dumb at Santa Fe, and the beautifying of the park that surrounds the capitol. Emphatic resolutions in favor of statehood embodied in a memorial to the Western States and to Congress were adopted, as well as resolutions commending and indorsing the Territorial administration. In all, 122 measures became laws and 25 memorials and resolutions were adopted.

STATEHOOD FOR NEW MEXICO.

This is a subject of paramount interest to the people of this Territory now, as it has been for the last fifty years, during which time efforts have been made at almost every Congress for our admission as a State.

In my previous reports I have urged the passage of an enabling act and have shown what steps had been taken heretofore by our people to that end, and the result of the constitutional convention held in 1889 under an act of the legislative assembly providing for the same. Since my last report the population and taxable property have materially increased, as well as the building of railroads and the establishment of other large industrial enterprises, as shown in detail throughout this report. These statistics and information from official sources I consider the strongest arguments that can be presented at this time in this behalf. The bill for the admission of New Mexico occupied a great deal of the time of the last Congress, and is now pending for the coming session, where additional facts and arguments will be presented in an official way to the body which alone can grant us that great privilege.

GENERAL PHYSICAL CHARACTERISTICS.

The area of New Mexico is 122,469 square miles, covering the Rocky Mountain Plateau on both sides of the great Continental Divide which cuts through the Territory from north to south. No part of New Mexico lies below an elevation of 3,000 feet above the sea level and the average altitude is between 6,000 and 7,500 feet, while the mountain peaks reach an altitude of between 13,000 and 14,000 feet. The entire Territory is within the so-called arid region, and, with the exception of several isolated mountain valleys and mesas, irrigation during at least part of the year is necessary for the successful prosecution of agriculture and horticulture. The Territory lies with its broadside to the sun, sloping from the north and center to the southeast and the southwest. The Rocky Mountain Range, which traverses the Territory from north to south, consists not only of a number of parallel ranges, but is split into mountain groups and ranges running from east to west, dividing the Territory into five large watersheds and a number of minor valleys, such as the Mimbres Basin, not having outlets. The principal river is the Rio Grande, which to New Mexico is what the Nile is to Egypt.

The Rio Grande coursing through the Territory from north to south divides it into almost equal portions. On the northeast the Canadian carries the waters of that section, which are not used for irrigation or lost by seepage, to the Mississippi. In the east and southeast the Pecos has eroded a valley and carries the waters of a large watershed to the Rio Grande and through it to the Gulf of Mexico. In the northwest the San Juan, Las Animas, and La Plata flow west into the Colorado River and thence into the Gulf of California. In the southwest the Gila carries the waters to the Colorado and the Pacific. Each of these rivers has many tributaries, and in consequence New Mexico is amply supplied with water, but the greater portion is permitted to flow to waste for the lack of storage reservoirs.

The climate of the Territory is affected greatly by its topography, its aridity, and its high percentage of sunshine. It is that which makes the Territory nature's sanitarium, not only for those suffering from lung and throat trouble but for many other diseases. The effect of the climate upon agriculture and other pursuits is dwelt upon at length in special articles that follow, while the physical characteristics and the status of agriculture, horticulture, mining, stock raising, manufactures, and advancement of New Mexico are reviewed in detail in the articles descriptive of each county and city which here follow.

THE COUNTIES.

New Mexico is at present divided into twenty-four counties, while provision has been made for the creation of a twenty-fifth county on January 1, 1905, when Torrance County, with the county seat at Progreso, will be established out of parts of Lincoln, Valencia, Bernalillo, Santa Fe, and Socorro counties. The counties in order of their area are the following:

	Square miles.		Square miles.
Socorro	15,250	Sandoval	3,959
Chaves	9,599	Leonard Wood	3,952
Valencia	7,944	Colfax	3,897
Grant	7,403	Doña Ana	3,818
Otero	6,870	Roosevelt	3,110
Eddy	6,506	Sierra	3,081
Union	6,037	Luna	2,946
Rio Arriba	5,810	Quay	2,805
San Juan	5,598	Mora	2,542
McKinley	5,377	Taos	2,283
San Miguel	5,001	Santa Fe	2,160
Lincoln	4,954	Bernalillo	1,567

BERNALILLO COUNTY.

Area, 1,567 square miles. Population, 25,500, the census of 1900 giving the area comprised in the county a population of 15,465, exclusive of 1,056 Indians. Assessed valuation, $3,103,050. County seat, Albuquerque.

Officials.—Commissioners, Severo Sanchez, T. C. Gutierrez, A. Harsch; probate judge, Jesus Romero; probate clerk, J. A. Summers; sheriff, T. S. Hubbell; treasurer, F. A. Hubbell; assessor, George F. Albright; superintendent of schools, Eslavio Vigil; surveyor, D. J. Rankin.

Newspapers.—The Journal-Democrat (daily), Albuquerque; the Daily Citizen (six times a week), Albuquerque; the Weekly Citizen, Albuquerque; Industrial Advertiser (weekly), Albuquerque; La Bandera Americana (weekly), Albuquerque; La Hormiga del Oro (weekly), Albuquerque; Abogado Cristiano (monthly), Old Albuquerque; La Aurora (monthly), Albuquerque; El Indito (weekly), Albuquerque; the Mirage (monthly), Albuquerque.

Post-offices.—Albuquerque, Old Albuquerque, Isleta, Alameda, Chilili, Escobosa, Milagros, Pajarito, Martinez, Carpenter, Padilla, and Guegos.

Bernalillo County has an area of 1,002,962 acres, of which 563,123 acres have been appropriated or reserved and about 425,000 acres are subject to entry under the Federal land laws. During the fiscal year ending June 30, 1903, there were entered in the county under the Federal land laws 3,831 acres; 3,671 acres of this under the homestead act. Bernalillo, which was up to a few years ago one of the largest counties in the Territory, is now the smallest though still the most populous. In shape it is almost a perfect parallelogram, 24 miles in width from north to south, and 48 miles in length from east to west. It is bounded on the north by Sandoval County, on the west by McKinley County, on the east by Santa Fe and Leonard Wood, and on the south by Valencia.

Since giving up three-fourths of its area to McKinley and Sandoval counties and about 100,000 acres to Leonard Wood County, it has a greater density of population than any other New Mexico county.

Estimates made by the Bureau of Immigration, based on the vote of the last election, give it a population of something like 25,500, three-fourths of which is within a radius of 5 miles of the court-house at Albuquerque.

The principal industries are manufacturing, farming, and fruit growing. Its central location, great diversity of topography and fine climate, together with the fact that the very heart of the Rio Grande Valley divides the county and extends through it from north to south, give Bernalillo County a prominence and attractiveness that well entitle it to rank at the top. There are in the county about 250,000 acres that can be made subject to irrigation, and about 300,000 acres are considered excellent pasture, the remainder of the area being in

the mountains which pass through the county from north to south near the eastern border. The mesas or table-lands are usually long stretches of plain, varying in width from 5 to 20 miles and extending from the base of the mountains in the direction of the valley, with an inclination of only a few feet to the mile and ending abruptly in a range of bluffs or sand hills, which form a background of brown for the verdure of the valley. These mesas and the mountains east of the Rio Grande are the principal grazing districts. In seasons of average rainfall the grass grows abundantly, and owing to its peculiar character it "cures" on the ground during the fall, and instead of "washing out" and becoming valueless like the ordinary prairie grass, it is like hay and makes almost as good feed in the winter as in the summer. These plains are dotted at all times of the year with herds of cattle and flocks of sheep.

During the summer and fall the animals have to be "held" comparatively near the springs or water holes, because cattle have to range where they can go to water during the warm weather once a day, and sheep at least once in two days; but after the weather gets cool and a little snow falls on the grass the animals, especially the sheep, can go a little longer time without drinking, and that gives them practically a fresh field in the winter.

THE IRRIGATION SYSTEMS.

The Rio Grande Valley is here broad and fertile, producing—under irrigation, of course—almost any crop indigenous to the temperate zone. The irrigation canals as yet still possess much of their original crudeness. There has never been a complete survey of the ditches or lands under them, and there are but few maps or records of any description in relation thereto.

The total area of land, however, under ditch is approximately 20,000 acres, of which not more than 4,000 acres are under cultivation. The remainder can all be irrigated and made to produce crops as soon as it passes into the hands of men who are willing to expend upon it the labor necessary to put it under cultivation.

By the construction of storage reservoirs in the mountain canyons to catch the storm waters which come down in great volumes during the rainy season, in July and August, and to conserve the waters of the small streams, thousands of additional acres of this valley land, as well as a large proportion of the mesa land, can be rendered arable and made to produce good crops.

The soil is unusually strong, especially in the mineral elements, being composed almost wholly of detritus from the neighboring mountains, and lacking only the addition of a very little animal or vegetable matter now and then to keep it rich indefinitely. A company incorporated under the laws of the Territory had started the construction of a canal which will have a length of about 40 miles, covering the most populous portion of the valley, and it is believed that its construction will render practicable the cultivation of all the land within that distance on the east side of the river, whereas at present only about one-half of it can be irrigated. This will make places for a large number of new settlers, and will do much for the development of that portion of the Rio Grande Valley in question, which is one of the most desirable sections of the Territory and one in which the farmers and gardeners

are never without a good home market for all of their products. Unfortunately work on this project has been suspended, although undoubtedly some day in the near future it will be completed. There are a few places in the county where private reservoirs have been constructed and are found to be successful in the irrigation of small tracts, but no work of this character on a large scale has yet been completed. There is also some farming done in the canyons, though in a very small way, the principal crops being potatoes, beans, and chili, and some wheat and oats. The mountain sides, when not too steep or broken, are found to be excellent fruit lands, and the yield is more certain there than in the valleys because less liable to injury from late frosts in the spring. Apples, especially the winter varieties, do better in the mountains than elsewhere, and it is believed by many that fruit growing on the mountain slopes will become in time a very important industry. In some of the mountain districts the rainfall during the growing season is sufficient to produce crops without irrigation.

AGRICULTURE AND HORTICULTURE.

The true farming policy in Bernalillo County is to have small farms closely cultivated and yielding as land can only be made to yield under irrigation. In the wheat and corn-growing States a man is supposed to need 160 acres to make a profitable farm, but a much smaller area is required here. It has been asserted that 10 acres of the valley land of this county, cultivated under irrigation, could be made to bring the owner a larger net cash return every year than could be realized from a quarter section in any of the grain-growing States. A farmer of twenty years' experience writes in support of this opinion as follows:

> Sweet potatoes of most excellent quality yield abundantly in the soil of this valley, and do not require to be irrigated as often as most other crops, thus saving the farmer much labor. Both soil and climate seem to be peculiarly adapted to their growth, and the quality of the product is fully equal to the famous sweet potatoes of New Jersey, while a fair average crop will give from 900 to 1,000 bushels to the acre.

The soil and climate in the vicinity of Albuquerque seem to be well adapted to the cultivation of tobacco of all varieties. Tobacco has been raised here for home consumption for several hundreds of years, and nearly all of the native sheep herders now raise all they use for smoking purposes.

One acre cultivated in sweet potatoes in Bernalillo County will bring the farmer as much money as he could hope to realize from 80 acres in corn or wheat in any of the grain-growing States, in a good year, and since the result is to be measured by dollars and not by acres it will be seen that the irrigation farmer, although he may not be able to cultivate fields as broad as those of his neighbor in the rain belt, has a better chance of success and a decidedly better prospect of a balance to his credit in the bank at the end of the year.

The onion is another product that seems to be peculiarly adapted to this section of the country. The large white Spanish onions, which grow to greater perfection in New Mexico than anywhere else in the United States, afford one of the most profitable crops that can be grown in this county, and is also one that can be brought to perfection only under irrigation. On account of its beautiful silvery color and

its peculiar mild flavor this onion finds ready sale in any part of the country and always commands the highest price. The yield is about 200 bushels to the acre, bringing $3 a bushel in the winter and spring.

Celery and asparagus are also articles which are especially adapted to the soil and climate of this county, and attain here a degree of excellence but rarely found in such articles grown elsewhere. The celery is superior to that grown in California and is pronounced by all who try it fully as good in all respects as the Kalamazoo, Mich., product.

In many places in the valley there are quantities of alkali which, though deleterious to some kinds of vegetables, is one of the favorite foods of asparagus, and does away with the necessity of applying salt to the ground, as is the custom wherever asparagus is grown in the Eastern or Middle States. It also causes the plant to attain in this section a degree of excellence in tenderness and flavor which is unknown in that grown elsewhere. During April and May, the months when the cutting is done, the shoots will attain, under favorable conditions, a growth of about 6 inches a day, every particle of which is edible. There is no woody portion to be thrown away. The whole stock is soft and tender, and the flavor is proportionately superior. The whole country is open as a market, and that such an article can be sold wherever introduced goes without saying, for it sells itself.

With 1 acre each of sweet potatoes, celery, onions, and asparagus, a man can make a good estimate of the money value of the crop that he will have for market each year. And in addition to this he will need 2 acres of alfalfa and 2 in corn or oats for his cow and horse, and 2 for house lot, orchard, and kitchen garden. That makes 10 acres in all, and is as much land as any man needs in this section to farm for profit, while it is as much as the most industrious man can properly cultivate in the crops named. There is good land for such purposes to be had in this county at fair prices and with good facilities for irrigation.

Alfalfa and melons do especially well in the Rio Grande Valley. Corn, oats, rye, and barley do well. Considerable attention is given to fruit growing. The valley is peculiarly adapted to grape cultivation. The grape most generally cultivated is that known as the "Mission" variety, supposed to have been introduced by the Franciscan friars and cultivated in this valley for the past two centuries.

The blooming fields of the Rio Grande stretching out toward the south with the picturesque Sandia Mountains for a background make this region ever an interesting landscape study.

The Rio Puerco, rising in Sandoval County and emptying into the Rio Grande in Valencia County, flows through Bernalillo County from north to south. The soil of the Puerco Valley is remarkably rich. Very little of it is at present under cultivation, though about 25,000 acres of it can be reclaimed by the storing of flood waters of the river.

MINERAL RESOURCES.

There are several mining camps in the county, though none of them have thus far been able to send much ore to market owing to the undeveloped state of their mines. Prominent among these may be mentioned Hell Canyon, Coyote Canyon, Las Placitas, and San Isidro. They all have rich leads, and lack only development to make them good

and profitable mineral producers. The whole western portion of the county is underlaid with deposits of an excellent quality of soft coal, which crops out along the banks of the Rio Puerco in many places. These deposits furnished fuel to Albuquerque, being hauled 20 miles by ox teams, before the extensive deposits at Gallup and Cerrillos were marketed.

SUMMER RESORTS.

There are several delightful summer resorts located in the mountains near Albuquerque, all easily accessible by drives of a few hours over beautiful roads and all well patronized by people of the city. Coyote Springs, 13 miles distant, and Hell Canyon, 20 miles to the southeast in the Manzano Mountains, are among the most pleasant and healthful resorts in the Rockies.

RAILROADS.

Bernalillo County has good railroad facilities. The Santa Fe system cuts through the county from north to south, while the Santa Fe Pacific Railway runs through part of the county from east to west.

The Albuquerque Eastern, 42.6 miles long, has been surveyed and partly graded from Moriarty to Albuquerque by way of Tijeras Canyon, and the Santa Fe Central Railway Company, which is building the Albuquerque Eastern, has also surveyed a line from Albuquerque to Durango.

TOWNS AND SETTLEMENTS.

Albuquerque, the county seat, and metropolis of New Mexico, is described under the head of "Cities and towns of New Mexico."

Chilili and Escobosa are rural settlements in the Manzano Mountains.

Other settlements are Alameda, which is in the Rio Grande Valley, near Albuquerque, Milagros, Pajarito, and Martinez.

Twelve miles south of Albuquerque, on the west bank of the Rio Grande and at the junction of the Atchison, Topeka and Santa Fe and the Santa Fe Pacific railways, is the Indian pueblo of Isleta, with over a thousand inhabitants. This relic of a former civilization is a source of never-ending interest to tourists.

The climate of Bernalillo County, while it possesses the general characteristics of New Mexico, is milder in winter than in more northern counties, and owing to its lower altitude the county is a sanitarium for those health seekers who can not bear the more severe winters and the greater altitude of the northern counties.

Financial statement of Bernalillo County, N. Mex., at the close of business June 30, 1903.

Cash balance January 1, 1903		$34,221.42
Receipts January 1, 1903, to July 1, 1903, tax collections	$40,899.31	
Receipts January 1, 1903, to July 1, 1903, other sources	14,231.45	
		55,130.76
Total to be accounted for		89,352.18
Remittances to Territorial treasurer	23,346.05	
Disbursements for all county purposes	40,408.63	
		63,754.68
Cash balance July 1, 1903		25,597.50

BONDED INDEBTEDNESS.

Title of bond.	Amount outstanding.	Date of bond.	Rate of interest.	When interest payable.	Place of payment of principal and interest.	Time to run or option.	When due.
Bonds of—			*Per ct.*				
1891	$17,000	Jan. 1,1891	6	January 1	Albuquerque, N. Mex.	10-20s	1911
1892	37,000	Jan. 1,1892	5.90	January 1 and July 1.	do	10-20s	1912
1895	64,900	Jan. 1,1895	6	January and July.	do	10-20s	1925
1897	50,100	Jan. 1,1897	6	do	do	10-20s	1927
Refunding bonds, 1901.	184,200	July 1,1901	5	March and September.	do	10-20s	1931

PUBLIC IMPROVEMENTS.

Court-house:	
Value of land and buildings	$60,000.00
Value of furniture and fixtures	15,000.00
Schools: Value of land and buildings	131,616.25
County jail:	
Value of land and buildings	12,000.00
Value of furniture and fixtures	3,000.00
Bridges	30,000.00

CHAVES COUNTY.

Area, 9,599 square miles. Population, 10,000. Census of 1900, 4,773, since when a large portion of the county has been taken toward the creation of Roosevelt County. Assessed valuation, $2,939,012. County seat, Roswell.

Officials.—Commissioners, T. D. White, W. M. Atkinson, A. M. Robertson; probate judge, J. T. Evans; probate clerk, F. P. Gayle; sheriff, F. Higgins; assessor, J. C. Peck; treasurer, M. Howell; superintendent of schools, J. McL. Gardiner; surveyor, W. R. Kinney.

Newspapers.—The Register, the Daily Record, and the Weekly Record, Roswell.

Post-offices.—Roswell, Dexter, Elk, Glen, Hagerman, Kenna, Lower Penasco, Felix.

Chaves County, the southeastern part of the Territory, is bounded on the north by Leonard Wood and Roosevelt counties, on the west by Lincoln and Otero counties, on the south by Eddy County, and on the east by Roosevelt County and the State of Texas. It has a population of over 10,000 and covers an area of 9,599 square miles. The open range live-stock interests were originally the mainstay of the county and continue to-day among the most important in point of tax-paying ability; but a fresh glory has come to that region of the Pecos Valley in late years in its great alfalfa and fruit farms; its splendidly stocked Hereford and Shorthorn breeding ranches; its growing sheep and wool interests and its wonderful system of artesian wells, unexcelled by any section of country in the entire west—if not in the whole Union. There are no mines in Chaves County; it is essentially a farming, fruit-growing, and pastoral region. The greater part of this large area is grazing land, pure and simple, excellent grass lands which sustain thousands of cattle and sheep the year round and which with the further development of water, that is quite practicable, will sustain even more. A great deal of range area is held by cattle owners, who have title, in many instances, to land on which are found springs and lakes, or on which they have dug or bored wells and put up windmills, and, owning these improvements, are able to control, in a manner, the range contiguous. But there are large areas of grass lands on which no water is found during a very dry season, and it is in such localities that the development of water is most important, since without water the range, although covered with the best of feed, is practically well-nigh valueless. To this matter—the finding of a water supply—a great deal of attention is being devoted at a heavy expense in some cases. Large well-boring machines, worked by gasoline engines, are being used, and the work is being carried on, slowly but surely, by men of means who understand the importance of procuring an adequate supply of water.

WATER SUPPLY.

The irrigation systems of Chaves County at present obtain their supply of water from three sources: (1) The immense springs in the

ONE OF THE MANY ARTESIAN WELLS AT ROSWELL.

vicinity of Roswell, fed by subterranean streams of artesian origin. From these five beautiful limpid streams of water flow, known as the North Berrendo, Middle Berrendo, South Berrendo, North Spring River, and South Spring River. These springs are the fishing grounds where disciples of Isaak Walton find rare sport catching black bass that are abundant. (2) The large number of artesian wells, for which this locality is becoming famous. (3) The flood waters from the great watershed of the White Mountain region, which extends for nearly 100 miles west of Roswell. The most of this supply goes to waste for want of storage reservoirs, which some day in the near future will be built, and these flood waters will then be used to make productive from 1,000,000 to 1,500,000 acres of rich fertile land which now produce only gramma grass for pasturage. Plans for the building of these reservoirs have been under consideration for some years, and need only brains, energy, and capital to carry them into effect and practical operation.

At Roswell begins the great canal irrigation system of the Pecos valley, a system which already represents millions of dollars in investment and which has demonstrated a production of fruits, forage, grains, melons, and vegetables in both quantity and quality unsurpassed anywhere. To this general canal irrigation the Roswell region adds an especial and ever-growing irrigation area through the medium of artesian wells. Nearly every ranchman of the Roswell region now has an artesian well with an attached system of water storage irrigation reservoirs.

A project is under consideration by the United States to build large storage reservoirs along the Rio Hondo, which rises in Lincoln County and flows eastward into the Pecos River as well as on the Pecos River itself. This will reclaim a large area of almost perfectly level and fertile land. The commission of irrigation of New Mexico has also granted projectors 30,000 acres, to be reclaimed by them, and work upon the enterprise is to begin next spring.

SETTLEMENTS.

Roswell and Hagerman are described under the heading of "Cities and towns of New Mexico."

In the southwestern part of the county is the lower Penasco region which has several small agricultural settlements and boasts of a number of fertile, prosperous farms and cattle ranches.

ARTESIAN WELL SYSTEM.

One of the many great factors of natural development of the Roswell region is found in the artesian well water deposit. This artesian belt comprises an already known and proved area of 8 by 70 miles, a length and breadth which is certain to be added to by early exploitation, This area now counts within its limits 75,000 acres of fertile irrigable soil and will eventually increase these figures to 125,000 or even 150,000 acres. The artesian deposit is found in a porous sandstone formation and includes what are locally known as "the first and second" water flows, the first flow being reached at from 150 to 200 feet, with a total well cost at from $200 to $225. The second water flow is tapped at about 250 feet, the wells costing from $300 to $350 each.

The wells of both the first and second flows are exhaustless, showing no shrinkage as time passes from their original water discharge.

A fair average of the many wells now in operation in the Roswell artesian belt is 600 gallons per minute. The city of Roswell itself now has a hundred of these wells, one of which, the railroad well, has a flow of 2,500 gallons per minute. A second, the Captain Lea well, discharges 1,500 gallons per minute, while a third, located in the grounds of the El Capitan Hotel, pours forth 1,200 gallons every sixtieth portion of an hour. With a proper system of storage reservoirs an artesian well here will afford ample water for the irrigation of 160 acres. The windmill is frequently used for the purpose of increasing the flow of an artesian well, the wind power doubling and trebling the rapidity of the water discharge.

A large number of wells are utilized for piping water into dwellings and business houses, the strong pressure making it practicable. A recent successful experiment by a citizen of Roswell has demonstrated the fact that this pressure is ample to operate a small hydraulic ram, costing $20, by which water can be forced into a large tank 30, 40, 50, or more feet above the ground and furnish stories of buildings. The artesian well development and its uses, including the furnishing of power for machinery, is in its infancy here, notwithstanding the satisfactory results that have already been obtained, and it is confidently believed that further developments, when test wells shall have been drilled to much greater depths, will make present results seem small.

FRUITS OF THE SOIL.

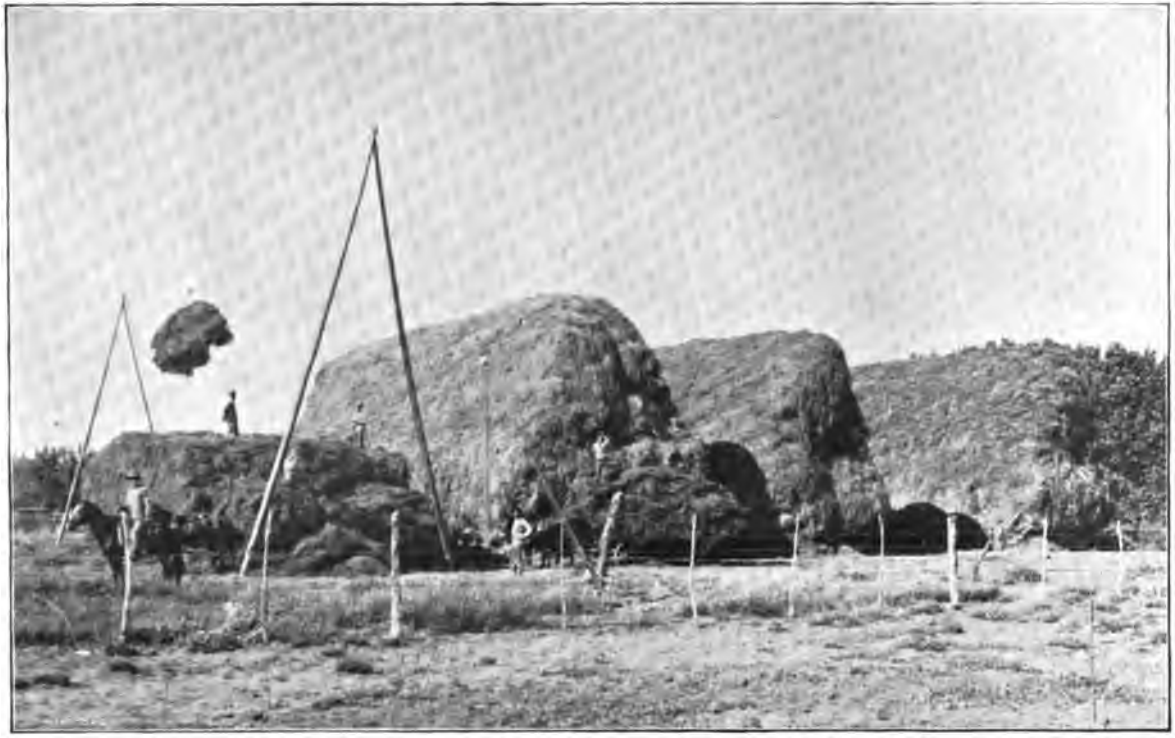
The Pecos Valley, of which the Roswell region is so prominent and prosperous a portion, is a late, conspicuous, and convincing example of the fact that irrigation cultivation is at once the most diversified and remunerative of all known methods of farming. The harvest, varied in its opportunities and croppage, is always assured with a maximum of production to a minimum of ground. The weather clerk is an unheeded agricultural personality and rainfall unknown as a potentiality.

The artesian well is a prominent and successful source of supply for the irrigation of the prolific orchards of the Roswell region. These orchards, almost entirely apples, now cover 12,000 acres, ranging from an acre to 500 acres in extent, the latter figure being that of the great Hagerman orchard, 5 miles from Roswell.

Plums, pears, and peaches—the latter when planted on high ground—also attain well nigh perfection. The Roswell peach in particular has added fresh fame to the Pecos Valley during the past year, having been sent to the markets of Colorado, Kansas, Illinois, and Michigan by the carloads in cold-storage cars, and won the highest praise from commission men and the public. A sample lot of 1,000 baskets, shipped by way of experiment to Detroit, Mich., was declared by the dealers there the finest peaches ever offered on the market. They commanded the top price, of course.

THE ROSWELL MELON.

Two years ago an effort was made, for the first time, to send the Roswell cantaloupe into the market centers of the Central West in com-



STACKING THE ALFALFA CROP IN CHAVES COUNTY.

petition with the Rockyford, Colo., product, and the experiment proved a most pronounced success, these melons arriving on the market ten days ahead of the Rockyford melon, and being in flavor and general character fully the equal of the famous Arkansas Valley production. By reason of its new direct railway connections with Kansas City, St. Louis, and Chicago, and the fact that the melons in the Pecos Valley ripen sooner than the Rockyford crop, the Roswell melon industry promises big results for the near future. Indeed, Chicago commission men have already largely interested themselves in the business of melon growing at Roswell, and arrangements have been made to push the industry for the season of 1904. A melon growers' association has been formed and some 500 acres will be planted to melons next season.

The croppage of Roswell land areas includes oats, rye, barley, Milo maize, maize, alfalfa, sorghum, millet, Kaffir corn, wheat, Irish potatoes, onions, celery, and a varied and sufficient schedule of minor garden vegetables. Alfalfa returns four crops per season, with an aggregate yield of 6 tons per acre.

ALFALFA AND ORCHARDS.

Alfalfa is the leading product, and stock growing and fruit raising are fast becoming the principal industries. A more vigorous healthy growth than is seen in the young orchards just coming into bearing can not be found anywhere. Apples, prunes, and all European plums do well. A few small vineyards, consisting mostly of the raisin varieties, are doing well, and a ready market is found at from 4 to 6 cents per pound.

The yield in a good average year of alfalfa is 7 tons per acre, including four cuttings and the pasturage. A prosperous alfalfa farmer of the Pecos Valley estimates that the aftermath from 100 acres after the fourth cutting is about 75 tons, and that the value of this after feed as pasture during the fall and winter is at least sufficient to pay the running expenses of the ranch, including the cleaning of the ditches, irrigation, use of horses, machinery, interest, taxes, and other incidental expenses. The cost of cutting, stacking, and baling and loading on the cars is about $1.50 to $1.75 per ton under favorable circumstances. The alfalfa sells anywhere from $10 to $12 per ton, leaving a net profit per acre of about $60.

Market gardening has been found extremely profitable, especially tomatoes, which grow to a size and beauty that can not be surpassed anywhere, and a good market is found for such products at Texas points.

The raising of sugar beets and the manufacture of beet sugar will undoubtedly at no distant day prove one of the great industries of Chaves County. The conditions of the soil, irrigation, and the climate are ideal for that industry.

CELERY PRODUCTION.

A production in which the Pecos Valley is gaining special distinction is its celery. It is an industry which is developing rapidly and constantly acquiring new markets. The most extensive production of this delicacy is near Roswell, on the Spring Brook celery farm. The

farm is watered by a great spring of water bubbling from mother earth, which combined with the continual sunshine peculiar to the Pecos Valley and the saline nature of the soil, makes a combination for growing a high grade of celery not possessed by any other country. The constant sunshine, which blushes the apple, crimsons the cherry, ripens the golden grain, colors the flowers and flavors the fruits with the choicest essence of nature's brewing, is no less potent in storing up those essential qualities in celery that raise it to a standard excelle. e surpassed by none, equaled by few, and may well be said to bear the same relation to the celery trade as gold to the monetary system. The celery raised in the Pecos Valley is pronounced by those qualified to judge superior to that raised anywhere else in the United States, and the fact that it leads all competitors in every market it has reached would seem to verify the assertion, particularly when it is known that it came in competition with the product of the most famous celery farms in the whole country. The soil of the valley seems to possess to a marked degree the constituents which impart to this table delicacy the peculiar nutty flavor so much sought after by epicures. The Spring Brooks farm has proven a full success, both in the production of the vegetable and in marketing it to financial advantage. The Roswell Register notes this fact in a paragraph which says:

W. M. Farmer has just received returns from his last shipment of celery. The total figures show that, in addition to supplying the local demand, he shipped 88,815 pounds. The express bill on this was $1,389.80. The gross income realized at the farm for the crop of 20 acres was over $6,000.

LIVE STOCK INTERESTS.

Chaves County is becoming famed for the breeding of the highest strains of Hereford and Shorthorn cattle. A great deal of money has been and is now being spent by men of wealth on stock farms with extensive alfalfa pastures for raising and fattening cattle. One of the largest undertakings of this kind is being developed by Mr. Hagerman on a tract of 15,000 acres of choice land, which he owns near the town of Hagerman, of which 5,000 is now in alfalfa. He expects to be able to fatten here and turn off to market yearly about 8,000 head of young beef cattle.

The Slaughter Hereford home farm has now 1,200 head of superb Herefords. The males include the celebrated Sir Bredwell, which cost Mr. Slaughter $5,000.

The Littlefield Cattle Company is breeding both Hereford and Shorthorn stock for a grading of their immense herd of 60,000 head of open-range cattle, while the Milne-Bush people have made a bovine ten-strike in crossing the highest class Hereford males with Shorthorn females.

Chaves County will soon be known as one of the most prominent successful Hereford breeding grounds in the United States. The pioneers in the industry here are men of ample means who have "set their mark high" and whose dictionary does not contain the word "fail." Their friendly emulation and that of others to follow will result in a few years in placing Chaves County in the front rank of fine whiteface breeding centers. The breeders of Herefords at present are devoting their attention largely to the raising of young bulls.

HOG RAISING AND ALFALFA GROWING IN A CHAVES COUNTY ORCHARD.

The home demand—the range-cattle owners—has so far taken all that could be raised. Inquiries are being made by large cattle owners from Mexico for young bulls with which to improve their herds and they will be good customers. Meanwhile, the old "stand-by," the Shorthorn, is not being neglected. There are three herds of 400 to 500 each, two of which are being bred straight, while the other, some 500 Durham cows, are being crossed with Hereford bulls. These herds are also owned by men who are able to breed the best and will do so. The result will be watched with interest. For the breeding of both Herefords and Shorthorns in the arid region the alfalfa farm is a necessity, and as that wonderful forage crop can not be raised successfully without irrigation, Chaves County with its abundant water, possesses advantages superior to any other portion of the Southwest.

Another important industry comprises the raising and fattening of hogs on alfalfa, in which line a splendid business has been built up, the swine thus fattened going chiefly to the Kansas City market.

The assessed valuation of the cattle in Chaves County for the year 1903 was $900,000, while the actual value is about $4,000,000. The New Mexico sheep sanitary board fixes the number of sheep in the county at 250,000. The county sends to market annually probably 1,500,000 pounds of wool and 500 carloads of beef cattle and sheep. The Lower Penasco section of Chaves County is located in the midst of a vast open-range stock country and constitutes an important factor in the general business of the county.

STATISTICS.

The population of the six precincts of Chaves County according to the census of 1900 is as follows: Roswell, 3,057; South Spring River, 420; Cedar Canyon, 183; Hagerman, 426; Lower Penasco, 334; Portales, 353. But so rapid has been the growth that these figures now read: Roswell, 7,800; South Spring River, 600; Cedar Canyon, 300; Hagerman, 800; Lower Penasco, 500, while Portales is in the new county of Roosevelt. According to the census only 304 of the population of Chaves County are foreign born, 66 are negroes, and 721 have one or both parents foreign born. Of the native white people of voting age only 95 are illiterate, a remarkably small percentage.

The assessment of Chaves for 1903 is $2,939,012, the highest per capita of any county in New Mexico, and showing the greatest increase of any county since 1900. The census credits Chaves County with 29 industrial establishments with an invested capital of $105,475, giving employment to 168 men and producing annually $317,121. At present there are 31 industrial establishments with an invested capital of $220,000, giving employment to 200 men and producing annually $417,121.

There are 5,351,106 acres of public land subject to entry under the United States land laws in Chaves County, a domain over 8,500 square miles in extent, or as large as the State of Maryland. During the fiscal year ending June 30, 1903, there were entered upon under the Federal land laws 354,131 acres, of which 67,749 acres were entered under the homestead act, and 21,990 acres under the desert land act.

FARMING BY IRRIGATION.

Farming by irrigation offers to the intelligent man the easiest avenue to independent living. He need not bend the suppliant knee to the passing cloud to open its treasure house that his crop may drink the life-giving shower, but simply opens the valve to his artesian well, or lifts the head gate in the canal, and from nature's great reservoir comes the liquid balm to appease the hot breath of the arid desert and carry life to the vegetable kingdom. Not a "nickel-in-the-slot machine" precisely is the artesian well, but an instrument entirely subservient to the will of man, dispensing with many difficulties and annoyances of ordinary irrigation from running streams. For instance, you need not clean your ditch two or three times a year, nor build up your dam after heavy floods, nor do you propagate a thousand varieties of obnoxious weeds that grow along the streams.

It is generally conceded that he who attempts to farm by the old slipshod method simply mortgages his year's labor for supplies, and owes for them at the end of the year.

SOME FARM PROFITS.

The modern intelligent farmer will measure his resources—water, labor, and general environments—with as much care as a bank accountant would give to his books, and will attain results consistent with his management and care. The artesian well affords ideal conditions for home making and intensive farming, as it enables one to dispense the exact amount of water necessary for growing crops and at precisely the right moment.

Attach to the well a water motor and you obtain power sufficient to run all light machinery, such as churns, sewing machines, and even a small sawmill, all of which relieves the burden of labor on the gentle housewife, and plants roses on the erstwhile pallid cheeks.

The reservoir in which you store water for irrigation affords opportunity to raise all the fish necessary for family use, while geese and ducks in limitless numbers may be raised on its placid surface, adding charm and beauty to the felicitous home.

In order to equip a farm successfully in the Pecos Valley one must have from $3,000 to $5,000. One hundred and sixty acres of land will cost $1,600, and an artesian well with an acre reservoir to irrigate it will cost $1,000 more.

The cost of dwelling and outhouses is altogether a matter of circumstances and may be estimated at $800 to $2,000, and a wagon, implements, and work stock will add $500.

THE MODEL 160.

With 80 acres in alfalfa, 40 in apples, and the remaining 40 acres cultivated in cantaloupes, celery, and home garden, any intelligent farmer can live independently and grow a good bank account.

Forty acres of alfalfa will yield 200 tons of hay worth $2,000; 40 acres of apples will sell for $2,000 to $3,000 from mature trees, while cantaloupes and celery will give a net income of $4,000 per annum. Incredible though it may seem, cantaloupes at this time are yielding to the grower a net profit of $300 to $500 per acre.

For successfully raising the higher grades of live stock it is necessary that every man should have an irrigated farm in order to raise winter feed as well as for pasture.

The Pecos Valley offers a boundless area of fertile soil with cloudless skies overhead, while underneath is nature's inexhaustible reservation of water awaiting the manipulation of machinery in the hands of man to bring it to the surface.

FINANCIAL STATEMENT OF CHAVES COUNTY.

Total indebtedness of said county up to June 30, 1903, is $53,000, composed of the following items:

Bonded indebtedness.

Date of issue.	Date of maturity.	For what purpose issued.	Rate of interest.	Amount.
	Years.		*Per cent.*	
Aug. 19, 1901	15-30	Current-expense bonds	6	$7,000
Jan. 1, 1901	10-20	Lincoln County indebtedness bonds	6	5,000
May 1, 1901	20-30	Court-house and jail refunding bonds	5	30,000
July 1, 1901	20-30	Lincoln County indebtedness refunding bonds	5	11,000
		Total indebtedness		53,000

Total assessed value of real and personal property for the year 1903, $2,989,012.

COLFAX COUNTY.

Area, 3,897 square miles. Population, census of 1900, 10,150; census of 1890, 7,974. In 1893 part of Colfax County was taken to form Union County. Present population, 19,000. Assessed valuation, $2,981,411. County seat, Raton.

Officials.—Commissioners, E. N. Burch, P. Y. Santistevan, J. C. Taylor; probate judge, J. C. Fresquez; probate clerk, J. P. Brackett; sheriff, Marion Littrell; assessor, J. Hixenbaugh; treasurer, G. J. Pace; superintendent of schools, W. A. Chapman; surveyor, P. M. Davenport.

Newspapers.—The Range, The Reporter, and The Gazette, Raton; The Colfax County Stockman, Springer.

Post-offices.—Raton, Springer, Elizabethtown, Dawson, Kiowa, Hebron, Vermejo, Van Houten, Aurora, Baldy, Bell, Blossburg, Chico, Cimarron, Colmor, Dorsey, Gardiner, Lynn, Maxwell City, Black Lake, Ponil, Rael, Rayado, Slagel, Catskill, Vanderitas.

Colfax, in many respects the most advanced and most prosperous of New Mexico counties, is bounded on the north by Las Animas County, Colo., with which it has many physical characteristics in common; on the east by Union, on the south by Mora, and on the west by Taos. For years, and up to 1884, its growth and development were retarded by the unsettled condition of land titles, but these have been adjusted, and the wise and generous policy of the management of the Maxwell land grant, coupled with the energy and thrift of the people of the county in general, have more than overcome the earlier drawbacks, and it is rapidly settling up; in fact, is one of the most densely populated counties in the Territory to-day.

AREA.

The area is 3,897 square miles, more than one-half being included within the boundaries of the Maxwell land grant. This area is more than three and a half times that of Rhode Island, twice that of Delaware, and one-half that of New Jersey. Nine counties in New Mexico have a less area. Of this extent 600,000 acres, or an area equal to that of Rhode Island, is still subject to entry under the Federal land laws. During the past fiscal year 8,000 acres were taken up by homesteaders, while altogether 23,504.27 acres were taken up under the Federal land laws. The Maxwell Land Grant Company also has thousands of acres which it sells to homeseekers upon very liberal terms. During the past year the Maxwell Land Grant Company sold 400,000 acres, which have been purchased by actual settlers mostly to use the grazing for the raising of live stock. On several of these ranches belonging to more well-to-do stock raisers fine homes have been built.

Colfax County is one of the so-called American counties; that is, the majority of its population is of Anglo-Saxon origin and English speaking. Of the descendants of the original Spanish settlers, many

speak the English language and are progressive and law-abiding people. In the coal-mining camps there are several hundred Slavs. According to the census of 1900, Colfax ranked eleventh in population among the twenty-four counties of the Territory, but as it is adding to its population more rapidly than many of the other counties, it is now seventh, with a population of about 15,000. It cast a total vote of 2,477 at the November election in 1902, being one of few counties which showed a decided increase in that respect, compared with the figures of the election in 1900. The census population was 10,150, or about three persons to the square mile, only Bernalillo, Santa Fe, Taos, and Mora counties exceeding it in density of population. The census population of the different precincts was as follows: Raton City, 3,540; Gardiner, 965; Catskill, 638; Elizabethtown, 577; Springer, 558; Johnsons Mesa, 487; Chico Springs, 389; Cimarron, 363; Martinez, 328; Maxwell City, 271; Colmor, 232; Dorsey, 217; Black Lakes, 216; Blossburg, 187; Trinchera, 184; Pena Flor, 152; Rayado, 135; Johnson Park, 118; Baldy, 111; Cimalario, 100; Ponil Park, 83; Elkins, 60; Ponil, 31. But since the census the coal-mining camp of Dawson, with 1,200 inhabitants; Willow, with 600 inhabitants, and other settlements have sprung into existence. The gain in population that Colfax County made from 1870 to 1900, thirty years, is 416 per cent.

The assessed valuation for the year 1903 is $2,981,411, only two counties showing a higher assessment and six counties a higher per capita assessment. However, the assessed valuation is but one-fifth of the actual value of property in the county, for according to the census of 1900 agricultural values alone amounted to $4,164,000, Colfax County being fifth in that respect among the 21 counties of the Territory at that time. Add to this the value of the coal and other mines, the value of railroad and city property and improvements and of industrial plants, and it will be readily seen that $15,000,000 is not an excessive figure at which to place the real value of property interests in the county, which figure is probably exceeded by only two other counties in New Mexico. The Dawson railway, which has recently been built, and another railroad to be built soon will in the future add materially to the assessed valuation of the county, and possibly make it the wealthiest county in the Territory.

TOPOGRAPHY.

The Taos range, rising at points to an elevation of almost 13,000 feet, and forming the backbone of the Rocky Mountain system in New Mexico, is the western boundary of Colfax County, and from it extend lesser ranges and foothills, gradually subsiding into high mesas and the plains in the eastern part of the county. The Raton Mountains form the north boundary, and while not quite as high as the Taos range, form a good protection against the chilly winds and storms of Colorado. The Raton and Trinchera passes form a natural passageway through this mountain range, while the Taos and Red River passes are the best highways over the Taos range. The Cimarron range, Baldy and Black mountains, diverge from the main Taos range. Some of the more prominent peaks are Raton, Vermejo, Costilla, Baldy, Red, Little Baldy, Agua Fria, Tinaja, Green Taos, and Antelope. The average elevation of the county is 6,500 feet, it being highest in the western and northern parts and lowest in the eastern and southern

section, the county sloping toward the southeast, making its climate the finest in the Southwest. Picturesque canyons and fertile valleys are found in the mountainous sections, while table-lands, rising abruptly from the plains, are a remarkable feature of the topography, the Johnson's, Eagle Tail, Gonzales, Black, Barela, and Rayado mesas being the most noted and largest of these table-lands.

The geological formation is the same as that of the famous mineral bearing and coal producing counties of Colorado. Associated with the uplifted cretaceous deposits and probably contemporaneous with their disturbance, immense dykes or wedge-shaped masses of trachytic eruptive matter are encountered, the presence of which has baked the shales into brittle slate and more or less metamorphosed the limestone and sandstone. This dyke-like mass is exposed in the eastern slope of Baldy Mountain, and in the upper canyon of the Cimarron it appears in picturesque pinnacled palisades. In the rugged flanks of Baldy Mountain numerous gold-bearing lodes appear intersecting the eruptive mass. In connection with the others of eruptive matter, the sedimentary strata were further subjected to intrusions from the same source, forming irregular interbedded contact sheets carrying gold. The latter occurrences extend south along the east flank of Black Mountain and on the upper waters of the Cimarroncito quite an extensive area has been developed. The disintegration of the formation containing the auriferous lodes by the erosive action of the air, water, and ice has concentrated vast quantities of gold particles in the clays and gravels filling the adjacent gulches and valleys and forming extensive and rich placer deposits. The latter occur on both sides of Baldy Mountain. In the west slope of Baldy valuable deposits of auriferous magnetic iron occur in connection with the cretaceous limestones.

RIVERS.

Compared with other parts of the southwest, Colfax County, although in the arid region, is well watered. This blessing it owes to the vast mountain ranges and extensive timber lands along its western and northern boundaries. Colfax also possesses some of the finest and most extensive irrigation systems in the Territory. It is principally in the drainage area of the Canadian River, in which the counties of Mora and Union are also situated in greater part and which extends into San Miguel and Leonard Wood counties. This drainage district is characterized by the presence of many small streams which are perennial in their upper courses but are dry during the greater part of the year in their lower stretches. The Taos range affords one of the best catchment areas in the Territory and the flow of streams from this range is constant and always to be depended upon. As a consequence, the irrigated area is almost wholly confined to the valleys of these streams in the western portion of the district, while the eastern portion being in reality a part of the great plains and dependent for its water supply upon the summer rains, is almost wholly devoted to grazing, except such portions of Johnson's mesa and other mesas where the annual rainfall is sufficient to raise crops without irrigation.

The Chico Rico has its source along the southwesterly slope of the Raton plateau, flowing thence in a general southerly direction and joining the Canadian River about 4 miles above the town of Dorsey. The flow of this stream is small, but permanent, probably not exceed-

ing 20 second-feet, except during floods. These occur during June, July, and August, and are of great volume. The normal flow of the river is wholly consumed, a portion being impounded by a dam 8 miles above Raton and carried by a pipe line to that city for domestic supply while the surplus is used for irrigation in the Chico Rico valley. The acreage under cultivation is 1,000 acres. No further increase in the acreage is possible without storage, but good reservoir sites are in the vicinity and at comparatively slight expense, sufficient water could be impounded to irrigate 5,000 acres more. Plans for another dam above the present one in the Chico Rico canyon are being made and the Raton Water Works Company expects to have the dam completed by January 1, 1904, thereby more than doubling the storage capacity.

The Vermejo River rises in the Costilla range in Las Animas County, a short distance beyond the Colfax County boundary. It flows southeast to a junction with the Canadian River, 6 miles south of Maxwell City. Its tributaries are the Caliente, the Saltpeter, and the Van Brimmer. The flow is permanent, the mean being about seventy second-feet during the irrigation season from April to September inclusive, and about ten second-feet during the nonirrigation season. The stream is subject to frequent and heavy floods during June, July, and August, measurements having shown a discharge at these times of 900 to 1,000 second-feet, amounting to 2,000 acre-feet in twenty-four hours. On the upper portion of the stream there are about 100 small individual ditches serving small tracts. There are also about nine other individual ditches between Dawson City and the Montgomery ranch, that are much larger, having a capacity of from five to fifteen second-feet each. Of corporation canals there are two belonging to the Maxwell Land Grant Company, each with a capacity of 400 second-feet. The amount of land irrigated under these systems is 11,000 acres, of which 3,000 acres are irrigated on the upper portion of the river by the 100 small ditches, 3,000 by the nine larger ones between Dawson and the Montgomery ranch, and 5,000 under the Maxwell Company's ditches to the north of the Vermejo. The normal supply of the stream is entirely consumed by the present systems. The Maxwell Land Grant Company has resorted to storage, having constructed ten reservoirs with a combined capacity of 6,000 acre-feet. Under the individual ditches there is one reservoir of 50 acre-feet capacity, but with these exceptions the ditches rely wholly on the river flow. This flow is always ample for all purposes in the spring, and in fact there is a good surplus, but is barely sufficient for the latter part of the season. Reservoir sites are so located as to be capable of economical improvement, and at least 10,000 acres more will sooner or later be brought under cultivation by utilizing these natural sites.

The Cimarron River is the largest stream. It is formed by a number of small streams originating in the Taos range and flows in a general southeasterly direction to a junction with the Canadian near the southeast corner of the Maxwell grant. Its principal tributaries are Ute Creek, Ponil, Cimarroncito, Urraca, and Rayado, in all draining about 40 miles in length of the eastern slope of the Taos range. The stream is perennial, and its mean flow from March to July, inclusive, is about 500 second-feet. In August and September this flow decreases gradually, the mean flow during the nonirrigation season being only about

50 second-feet. The total annual discharge of the stream reaches from 150,000 to 200,000 acre-feet. On this stream freshets occur only occasionally, there being at times periods of several years intervening between them. There are thirteen individual ditches and one corporation ditch on the Cimarron and tributaries, divided as follows: On the Cimarron the Springer ranch ditch, capacity 150 second-feet; two smaller ditches on the same ranch, carrying 20 to 40 second-feet respectively, and two ditches near the town of Cimarron carrying 20 second-feet each. On the Ponil there are three ditches carrying 20 second-feet each. On the Rayado there are three ditches carrying 20 second-feet each. On the Cimarroncito there are two ditches carrying 10 and 20 second-feet respectively. The corporation ditch is the Maxwell Land Grant Company's Springer ditch, with a capacity of 400 second-feet. In the spring of the year there is a surplus of water over the amount required, but during the late summer and fall the water is more scarce. The Maxwell Land Grant Company has constructed four storage reservoirs, the largest of which, the Springer reservoir, covers an area of 300 acres and has a capacity of 5,000 acre-feet; the others have a combined capacity of about 1,000 acre-feet. Plans have been completed and work is to be begun shortly on two large storage reservoirs on the Springer ranch in the vicinity of Springer. The reservoirs will be on the north side of the Cimarron and will have a capacity of 5,100,000 and 9,144,000 gallons, respectively. Two canals, with a flow of 5,161 gallons a minute, and each 4 miles long, will carry the water from the reservoirs. The land irrigated under these systems is about as follows: One thousand acres under the small ditches along the Cimarron bottom; 500 acres under the Ponil ditches; 1,000 acres under the Rayado ditches; 2,000 acres under the Maxwell Company's ditch, and 2,500 acres under the Springer ditch. The whole consumes about 25 per cent of the annual discharge of the Cimarron, leaving a surplus of from 100,000 to 150,000 acre-feet passing down the Canadian to the Gulf of Mexico each year. The entire flow is capable of conservation, as there are a number of good reservoir sites at different points in the Cimarron drainage basin, and at least 100,000 acres more could be brought under ditch.

A splendid natural reservoir site exists at the so-called Eagle Nest Rock at the head of the Cimarron Canyon where the same opens out into the Moreno Valley. At this point the river breaks through a gorge only 250 feet wide and supported on both sides by large granite dikes. A 100-foot dam could be constructed here at a moderate cost, thus impounding sufficient water for the irrigation of from 50,000 to 100,000 acres about 30 miles below. The attention of the National Government has been called to this site than which no better exists in the arid region. Under the Springer Ranch ditch one reservoir site can be improved with an impounding capacity sufficient to irrigate 3,000 acres. On the north side of the Cimarron River there are two large basins with a storage capacity of 10,000 acre-feet.

The proposed reservoir at the head of the Cimarron Canyon it is believed has been at one time a lake and the water broke through on the eastern side where the river now flows. It is surrounded on all sides by high hills, the same making a permanent and absolutely safe embankment for the reservoir, subject to no possible break on any side except a small narrow pass where a dam will have to be built. This pass comes down to a point only from 15 to 20 feet across and

widens out upward. There is plenty timber, stone, and other material for the building of the dam, and it would not be expensive. It is believed that this is one of the most valuable reservoir sites in the West. Smaller sites are to be found in the Ponil, Cimarroncito, Urraca, and Rayado canyons. About 100,000 acres could be irrigated from the Cimarron system and 140,000 acres in all could be irrigated by utilizing all the available reservoir sites in which the surplus water could be stored.

The Sweetwater Creek, Jarretas Creek, Chico, Rito de la Llano, Eagle Creek, Raton Creek, Cerososo, Pond, Ural, Trinchera, and Hol Keo are other streams in the county, along the course of several of which there are small irrigated areas and splendid reservoir sites.

During the winter the canyons in the mountains are filled with snow, which gradually melts during the spring and summer, furnishing a sufficient supply of water for the needs of irrigation. There are several beautiful lakes, the best known and largest being Black Lake in the southwestern part on the Mora County boundary.

Many wells have been dug, and especially on the eastern plains plenty of good water is found at a depth from 12 to 50 feet. There are indications of an artesian flow, and sooner or later artesian wells will be drilled.

The only artesian well that has been bored in the locality where there are indications of water has been a success, for several years ago artesian water was encountered at a depth of less than 150 feet on the John C. Taylor ranch, about 6 or 7 miles east of the town of Springer. It is very probable that more wells of the same kind could be had at other places. During the past few months two companies have been organized at Raton for the purpose of drilling for oil. Holes are being bored east and south of Raton. Up to date considerable water has been found and a sufficient quantity of oil encountered to warrant going deeper, and at present writing the drilling is being vigorously prosecuted.

The irrigation works of the Maxwell Land Grant Company are rivaled only by those in the lower Pecos Valley. There are two systems, the Springer and the Vermejo. The ditches of the first named take their water from the Cimarron just below the mouth of the Ponil. Six miles beyond the headgate the canal divides into two main laterals. The grade of the main canal is 5½ feet to the mile. It is 20 feet wide at the bottom and 4 feet deep. At the water surface it is 40 feet wide. Besides the direct flow of the Cimarron and Ponil, the Springer canal is reinforced by the flow of other streams, altogether taking up the drainage area of 30 miles of the Taos range. A series of reservoirs has been constructed along this irrigation system.

The Vermejo system is even more extensive. The headgate of the canal is situated on the Vermejo River above Dawson City. The main canal is the same depth and width as the Springer Canal, and there are 20 reservoirs along the route. The storage capacity of these reservoirs, the largest of which holds 11,000 acre-feet, and the Oyster Lake and Laguna Madre, holding 3,000 and 2,000 acre-feet, respectively, is much increased by reason of the fact that they may be drained and refilled several times during the season. Several other systems under contemplation will give Colfax a larger area of land under ditch and cultivation than any other county in the Territory.

CLIMATE AND HEALTH RESORTS.

The climate is almost perfect. The varying elevation from 4,000 to 12,000 feet gives a great range of mean annual temperature, but whether at 4,000 or at 12,000 feet there are the same constant sunshine, the same cool nights in summer, the same dry, rarefied atmosphere, the same protection from the north and west winds, which are the ideal conditions for the cure of consumption and throat trouble. As a result, the number of health seekers flocking to Colfax County is increasing every year, and those who have once lived in this invigorating air of that part of the Southwest will always long to return to it. The average mean temperature at Raton is 52° F. The average minimum is 32°, but owing to the dryness of the atmosphere and the constant sunshine, the minimum temperature seems less cold than a much higher temperature in more humid and more cloudy regions. In the sun the temperature in winter is 20° higher than in the shade. In summer the average maximum temperature is 70° and very seldom reaches 90°, while the nights are always cool, seldom exceeding a maximum of 60°, which, on account of the dryness of the air, feels as if it were 10 degrees lower, so that woolen blankets and woolen undergarments are needed the year around. The average annual rainfall is 14 to 19 inches on the mesas and 30 inches in the mountains.

The entire county is one extensive health resort, and people have found accommodations among friends and otherwise, but there has been recently a large sanitarium fitted and equipped about 20 miles east of Springer, where Dr. H. B. Masten has converted the so-called "Dorsey ranch" into an excellent health resort. This ranch was famous for its magnificence while the home of Senator Dorsey, and was built and equipped without counting the cost. It is a natural location for a sanitarium, and this, with the splendid improvements now there, make it an ideal place for the health seeker to spend a few months and recuperate. The post-office address is Chico, N. Mex.

AGRICULTURE.

The conditions for the pursuit of agriculture and horticulture are ideal. The abundance of water for irrigation, the absence of extremes in temperature, the ability to control the water supplied to the plants, the constant sunshine, the virgin soil, and the splendid markets which the railroad towns and mining camps afford make farming a profitable occupation. The Sweetwater Valley 20 miles long, the Rayado and Cimarroncito valleys each 12 miles long, the Cimarron Valley 30 miles long and in places 2 miles wide, the Ponil Valley 25 miles long, the Vermejo Valley 40 miles long, the Red River Valley 50 miles long, the Uno de Gato and Chico Rico valleys each 15 miles long, the Moreno Valley, the Valle de Piedra, the Vermejo Park, the Johnson mesa, the Barela mesa, and the section around Black Lakes are good farming country in which the best of wheat, potatoes, beets, cabbage, carrots, parsnips, turnips, artichokes, celery, and other products of the temperate zone flourish. In the production of certain vegetables the county excels, especially in onions, sugar beets, and cabbage. Onions weighing 4 pounds and 7 inches in diameter have been exhibited, and the delicacy of their flavor is far-famed. Full-grown cabbages weigh from 20 to 40 pounds per head. Potatoes grow especially well in the moun-

tain valleys, 200 bushels per acre being an average crop and 400 bushels to the acre are frequently raised. This is of especial advantage, as potatoes can be raised successfully in but few other parts of the Southwest. Springer would be an ideal site for a beet-sugar factory, as the sugar beets raised in that section are extraordinarily rich in sugar contents and are exceptionally pure. A considerable tonnage of sugar beets is shipped to the Colorado beet-sugar factories annually. Thousands of acres in that vicinity can be brought under ditch and successfully cultivated, as the rich soil is very deep and fertilizes itself from the water needed to irrigate it.

Johnson's mesa, 8,000 feet high, beginning 8 miles east of Raton and extending into Union County, is remarkable in that it is situated in the rain belt, while the country all around it is arid. No irrigation is needed, therefore, to mature crops on the mesa. A colony of Missouri farmers has taken up nearly all the available land on this mesa and is cultivating it with great success. Land can be bought there from $5 an acre up to $200 an acre. Poultry farms, creameries, and cheese factories on a small scale have been erected on the mesa and are doing well. On the Barela mesa a similar condition of things prevails. On the Sugarite is the largest dairy farm in New Mexico.

The Springer, Mills, Dawson, Chase, and other ranches, located in various parts of the county, are famous for their extent and rich crops, including fruits of the finest quality. Alfalfa is the principal forage crop, and on account of the great live-stock interests is very profitable. Apples, peaches, pears, plums, apricots, and other deciduous fruits flourish and attain a size and flavor that put into the shade the best of California fruit. All fruits raised in a colder climate than California are much better flavored, and Colfax County fruit has taken prizes at several expositions.

The Maxwell grant, as well as southern Colfax County, where is located a fertile strip of agricultural and grazing lands between the boundaries of the Maxwell and the Mora grants, are attracting many home-seekers. The scenery is unsurpassed, and beauty is in every line from the prairie to the highest mountains. The first plateau of the mountains is covered with pine and spruce timber, which supplies the lower country with lumber for building and railroad purposes. In the southern part, on account of the prolific pasture, cattle do exceptionally well. Farms dot the plains all the way up to the foothills and beyond them to the divide. From this divide in southern Colfax there is a splendid view of the Black Lake country, which forms a basin with mountains towering on every side. After winding one's way down into the valley, upon reaching the foothills, settlements appear as far as the eye can reach, with well-cultivated farms and ranches stocked with cattle and sheep. The beautiful Black Lakes, the timbered mountains, make a picture of wonderful beauty, and on every side may be found a happy, contented, prosperous people.

LIVE STOCK INTERESTS.

Colfax County is an ideal section for the farmer and the fruit raiser, but it is still more so for the live stock owner on account of the mild winters and the extensive free range covered with nutritious grasses which seem to be of a better quality than elsewhere. It is said that this grass does not die in winter, but only turns yellow, and with the rain in the

spring will again freshen up. The same grass is found elsewhere in New Mexico. The cheapness of the grazing privileges which may be secured from the Maxwell Land Grant Company, the abundance of water, and the abundant shelter, make Colfax County a stock country par excellence. As a consequence, 85,000 head of cattle graze on the mesas and in the valleys, large flocks of sheep browse in the foothills, and many herds of goats clamber along the mountain sides. One stock ranch alone covers 120,000 acres. The Charles Springer breeding farm near Springer and the W. C. Barnes ranch near Dorsey produce some of the highest grade Herefords raised in the West. The Red River ranges in the Catskill and Vasquez region have been heavily stocked. During the past year the Maxwell Grant Company has sold 400,000 acres—an area almost equal to that of the State of Rhode Island—to ranchmen and farmers, considerable of it in small tracts, at very low prices. The live stock business is undergoing a gradual change, the free range being supplemented by feeding in winter and the open ranging in winter by comfortable shelters, thus reducing losses to a minimum and improving the grade. The stock business is quite profitable if there is sufficient capital and experience back of it.

TIMBER.

In its timber Colfax County possesses a great source of wealth. The splendid timber lands in the northern part led to an extension of the Colorado and Southern Railroad into that section, while the timber areas in the western and southern parts of the county are practically untouched. On the slopes of the Raton and Taos ranges there are half a million of acres of merchantable timber, principally yellow pine and cedar, and it is only in late years that the sawmills have been making visible inroads on this supply. Catskill was the center of the timber industry in the north, and the Colorado and Southern Railroad in that section has been following the sawmills almost to the top of the divide of the Taos range. The Department of Agriculture is at present considering plans to retimber this part of the county. It is curious to note the reforestation going on in the districts that were practically denuded of timber some years ago in the Catskill region. While naturally a slow process, the hills are now covered with a healthy growth of young oak and pine, and nature is doing what for men would be impossible.

MINING.

Colfax is one of the leading mining counties in New Mexico, and its annual mineral product is worth over $1,000,000. Gold and copper are produced in the vicinity of and at Elizabethtown, which is one of the most famous gold mining camps in the West. In the Moreno Valley, immediately to the south of Elizabethtown, the Oro Dredging Company of Chicago has constructed a placer dredge on placer lands purchased by the company a year ago. The dredge was manufactured by the Bucyrus Company of Ohio. It has been a success from the start, and handles 4,000 cubic yards of dirt daily. The machinery is being operated day and night, and an electric plant erected on the boat furnishes light for night work. Owing to the altitude of 8,000 feet, about the middle of December the ice in the pond in which the dredge floats becomes too thick for operations, and work is discontinued from

that date until the 1st of March. There is very little water necessary for the operation of the plant, as the water required in the sluice box is used over and over again. The values of the placer ground handled are from 30 cents to $3 per cubic yard, and during the past fiscal year the dredge cleared over $100,000, which is about one-third of the gold production of New Mexico.

The first information relative to the Moreno placer fields and their mineralization was given early in 1866 by a young Indian who visited Fort Union and told the soldiers that there was copper on Baldy Mountain, referring to the present site of the Mystic mine. Upon this information the soldiers started on a prospecting tour. A few of them pitched their tent near the present site of Elizabethtown, and there panned some of the dirt and found some of the soil filled with particles of gold. They had camped under a willow tree, which they named Discovery Tree; this tree served as a landmark from which claims were staked and numbered consecutively. In 1867 rich placers were discovered in the Moreno Valley which resulted in an influx of prospectors, who demonstrated the presence of gold in paying quantities, but the old hand rocker, the ground sluice, with little water, and other similar devices were of little use to handle the vast amount of ground containing the precious metal. To get water to the placers a stock company was organized with $150,000 capital, but before it had completed its work it had expended $300,000. The company sought to utilize the water of the Red River, in Taos County, and to conduct it to the placers it constructed what is known as the "Elizabethtown" Ditch, with numerous reservoirs. This was completed in 1868.

It was a colossal undertaking, a work which stands to-day as a marvelous piece of engineering. The ditch forms three-quarters of a circle in its length of 42 miles, skirting along the edge of the mountains, bridging ravines and gulches with more than 20 flumes. In places the canal bed was made in perpendicular walls of solid rock with drill and powder. Later on the supply of water was increased by a ditch 7 miles long from Moreno Creek, and out of the Ponil River from the east side of Baldy Mountain. The undertaking was no small one, as all supplies and material had to be freighted from the Missouri River. It was this water supply that caused the camp of Elizabethtown to reach a population of 5,000 during 1868 and to give it the distinction of being the first incorporated city in New Mexico, and even to-day may be seen from Elizabethtown a dozen or more sprays which look like so many fountains playing on the placer banks and supplied from the great ditch. Four hundred ounces of gold have been taken out in one clean up, and as high as $25,000 have been made on a single shipment. Although over $2,000,000 in placer gold have been removed from the banks of the Moreno Creek only a small portion has yet been worked, and an area of 6,000 acres remains intact with an average depth of 10 to 140 feet to bed rock. It has been demonstrated that the Moreno Creek bed, with its numerous bars and gulches, from Elizabethtown to the mouth of Cimarron Canyon, a distance of 6 miles, is rich with both fine and coarse gold. This portion, owing to the fact that the débris or tailings are not easy to dispose of, must be worked by dredges. Already this manner of working has proved a success, and the near future will find the valley studded with steam-shovel appliances which easily separate the gold from its gravelly bed.

Owing to the distance the water flows in the Elizabethtown ditch considerable is lost by evaporation and seepage. It is proposed by the owners to shorten the ditch to nearly 35 miles and to put in 4 miles of pipe line. This will give twice the water capacity. With timber plenty and accessible, an equable, temperate, healthful climate, the advantage of a good supply of water, modern dredges, and the development of the lode mines, Elizabethtown will again take its place as one of the leading mining camps of the Southwest.

The oldest and best known mine in Colfax County is the Aztec, situated 8 miles due east of Baldy in the Ute Creek district, which has produced over $1,000,000 in gold, including $21,000 taken out in a single week. It is still a producer. This mine consists of a large vein occurring on a contact of quartzite and black slate; the crevice between walls varying from 8 to 20 feet in thickness and is remarkable for its continuity. Large bodies of good ore have been opened up in recent years which run not less than $10 per ton in free-milling gold ore, besides what passes over for concentrating, estimated to be sufficient in quantity to keep a 40-stamp mill busy for three or four years at least. In addition to this main body of ore which is found on the contact there are eight narrow fissure veins, practically vertical, occurring in the quartzite, being spurs of the main contact, from 4 to 10 inches in thickness and very rich, varying from $20 to $40 in native gold. From these fissures many very fine specimens of ribbon gold have been taken.

The Montezuma, which has ample milling facilities, is another of the old gold producers of the camp. It is nearly a vertical fissure vein cutting abruptly through the porphyry and the strata of limestone, which is the bed rock of the country. The vein varies from 2 to 4 feet in width. About $300,000 in gold has been taken out of this mine, and it promises to be a steady producer for years to come. Other important mines in this section are the French Henry, in conglomerate, with an average width of 8 feet of low-grade, free-milling ore, running from $5 to $25 per ton and assaying in spots as high as $2,000 per ton; the Bull of the Woods and the Homestake, located on a vein about 18 inches wide, which has a dip of 20° from the vertical, has been developed to the extent of about 5,000 feet in tunnels and whims, and carries ore running from $5 to $10 per ton; the Black Horse group of five claims in a limestone formation cut by porphyry dykes, and showing practically vertical veins at a depth of 400 feet with pay streaks from 2 to 6 feet in width that run from $10 to $100; the Rebel Chief group of six claims in formation similar to the Black Horse, developed to the extent of about 3,000 feet, with a vein dipping about 20° from the vertical in porphyry, and showing an abundance of milling and concentrating ore; the Harry Lyons, on the south side of American Mountain in the Ponil district, with an 8-foot vein between a contact of black lime and a quartzite conglomerate, showing seams of ore that run from $20 to $200; the Legal Tender in Willow Creek district, showing a vein of from 8 to 10 feet wide, which yields from $20 to $200 a ton in an arrasta and has been developed 650 feet; the Red Bandana group in the Moreno Valley district, showing a vein about 30 feet wide in slate which carries free milling ore that runs from $8 to $10; the Red Bandana group of mines, consisting of eight very promising mines, seemingly centering into one mother vein farther down. This group has been developed considerably, having 2,000 feet of tunnel work completed; the Galena lode in the Moreno district

showing a strong 8-foot vein of ore in a slate formation that mills from $4 to $20 in gold and a remarkable streak of galena, which, as depth is gained, changes into a rich gold-bearing carbonate, which concentrates readily and makes a shipping product of great value; and the American Flag, in Grouse gulch, developed to the extent of 500 feet in tunnels and other workings on the vein, showing a body of 2 feet of free-milling gold ore and a large body of smelting lead ore carrying high values in gold.

The Ajax is also a gold property of great value that has brought a fortune to its owners. The Senate and Bobtail mines in the Baldy district have attained a depth of over 400 feet in a tunnel of 350 feet in length, and have encountered the same rich vein that is exposed in their surface workings higher up on the mountain. The Woodland Company has struck the surface outcrop vein at 350 feet depth, and has opened a 4-foot body of ore that averages $52 per ton. On Comanche Creek, 3 miles west of Elizabethtown, is the Victor No. 7, on which has been opened a perfect network of quartz veins varying in width from 12 inches to 40 inches and yielding $6 to $130 in gold per ton. The Confidence mines and mills, the Jayhawk and other promising properties, are being worked persistently and with good results.

In the Cimarroncito district, 10 miles from Baldy, the Contention Company has a group of claims in which a large body of ore has been opened by a tunnel 1,500 feet in length. Farther in, 200 feet, there is known to exist a pay vein. For this the company is now driving, and will strike the main vein 1,500 feet below the surface workings.

The Golden Ajax, the Red Bandana, the Black Horse, and the Bidwell Company are among the corporations that are successfully operating Huntington and other mills.

Large bodies of graphite or plumbago have been opened near Raton, and all the materials for the manufacture of glass are found near that city. Near Springer exist large deposits of cement rock which have been worked successfully, as well as gypsum. Around the Black Lakes mineral indications abound, and in other parts, scarcely yet prospected, there are more indications of valuable mineral.

COAL.

It is not alone in gold that the wealth of Colfax County lies, but also in its immense deposits of coal. Its coal production is worth more in dollars and cents at present than the product of any other industry in the county. The traveler coming into the county from Colorado will notice in going over Raton Pass many seams of shale and coal where the railroad has cut through the rocks, or see outcroppings of coal high up on the mountain side. Within the past year two new coal camps have been established, one at Dawson and the other at Willow, now called Van Houten, and coal has during the year, brought the Dawson Railroad from Tucumcari, a station in Quay County on the Chicago, Rock Island and Pacific Railway, 110 miles into Colfax County which now outranks McKinley County as a coal producer and is the leader in New Mexico in that respect. For years the principal mines in operation were located in the vicinity of the coal camps of Blossburg and Gardiner, about 5 miles from Raton. These mines are owned and operated by the Raton Coal and Coke Company. At the Gar-

diner mines there are two veins of commercial value known to exist in these coal measures. These veins are about 600 feet apart. The upper vein, known as the Tin Pan vein, is about 4 feet in thickness. The lower vein is the only one worked at present. The mines furnish an excellent quality of bituminous coal. The company controls 10,000 acres of the best coal-bearing lands in New Mexico. The principal mine is the Blossburg mine in Dutchmans Canyon, all other mines in the vicinity having been abandoned owing to faults encountered within the coal measures. The Blossburg mine, however, is proving to be a good proposition, and during the next fiscal year should produce 300,000 tons. The coal is sold to the Atchison, Topeka and Santa Fe, the Mexican Central, and the Southern Pacific railroads. The average number of men employed is 400.

This mine will give access to several million tons of coal, and the output of coal in Colfax county will be largely increased during the next few years. The company also operates 76 beehive coke ovens of standard size, 13 feet in diameter. An economical device in connection with these ovens is the utilization of the surplus heat liberated in the coking process for the generation of steam. This is done by means of a hot-air flue located between the ovens which are double-row batteries. The waste heat is conducted by means of this flue to the boiler plant, midway between the two batteries of ovens and generates the steam power required for a large electric plant. The average product of these ovens is 25,000 tons of coke a year, valued at $2.50 per ton at the ovens. A first-class washing plant, having the most modern and economical appliances, with a capacity for washing 1,000 tons of coal per day, is a part of the equipment. The company has 18 coal cutting machines with a capacity of 250 tons per day each. These machines are operated by electricity. The motive power is supplied by 3 steam engines, two of 175 horsepower each and one of 200 horsepower, which in turn operates 3 electric generators which furnish 500 horsepower for direct use. The loaded cars are gathered from the rooms by mules and hauled to the main entry, where trains of 40 to 100 mine cars are made up and hauled by electric motor to the tipple. The mines are operated by the slope, double entry, room, and pillar systems. The towns of Gardiner and Blossburg are typical coal-mining camps. There are over 250 dwellings in Gardiner, as well as office buildings, boarding houses, hospital, and schoolhouse. The company owns the store there.

The Colfax coal mine is situated 1½ miles north of the town of Raton. The product is hauled in wagons to the city and there sold to the domestic trade. The mine is ventilated by a furnace. The vein is 4 feet 6 inches in thickness, and produces a good quantity of bituminous coal. The mine is opened by a drift 700 feet in length, and its annual product is about 3,000 tons, estimated to be worth $5,000 at the mine. Six men are employed.

The Sugarite mine is 7 miles east of Raton near the Sugarite Creek. A drift has been run in 400 feet, on a vein 5 feet thick, of an excellent quality of bituminous coal. The coal is marketed at Raton, Las Vegas, and Albuquerque.

The Llewellyn mine is situated 12 miles northeast from the town of Raton. It is situated a few hundred feet below the lava cap which constitutes the top of Johnson mesa. The vein is 7½ feet thick and the coal is bituminous. The mine has been opened by a drift 500 feet

long. It produces about 3,000 tons of coal annually, valued at $3,000. The coal is hauled in wagons to Raton and Mora and there sold for domestic use.

The Dawson Fuel Company has purchased 20,000 acres of coal land in western Colfax County and has built a large coal and coking plant near Dawson city. The town is located at the terminal of the Dawson railroad, which connects with the Atchison, Topeka and Santa Fe Railway at French, and with the Chicago, Rock Island and Pacific Railway at Tucumcari. The camp already has 1,500 inhabitants. There are two mines opened thus far, each producing 1,500 tons daily, most of which is shipped to the southern and eastern markets and a large part of which is manufactured into coke in the 100 coke ovens erected on the premises. The coal is washed and crushed in a modern washing and crushing plant before it is manufactured into coke.

The Raton Coke and Coal Company has established a new coal mining camp in Willow Canyon, 16 miles south of Raton. A 9-mile branch railroad has been built from Hebron on the Atchison, Topeka and Santa Fe Railway to the camp, which now has 1,000 inhabitants. The company operates three mines at this place, which produce 1,500 tons of coal daily.

There are coal indications in other parts of the county which will sooner or later be developed. The following are the average wages paid in the coal mines: Pit bosses, $3 per day; fire bosses, $2.50 per day; shot firers, $2.50 per day; machine men on coal-cutting machines, $3 per day; helpers on coal-cutting machines, $2 per day; track layers, per day, $2.50; company timber men, $2.80 per day; miners, $75 to $100 per month; single mule drivers, $2.80 per day; car couplers, $1.50 per day; boys, $1 per day; stable boss, $75 per month; electricians, $100 per month; linemen, $65 per month; motormen, $75 per month; engineers, $75 per month; boilermen, $70 per month; weighmen, $75 per month; tipple men, $65 per month; blacksmiths, per day, $3.50; blacksmiths' helpers, $2 per day; carpenters, $3 per day. About 1,000 men and boys find employment in the coal mines of Colfax County.

Jo E. Sheridan, United States coal mine inspector, in his report for 1902 speaks as follows of the Dawson coal camp and mines:

The development upon the Dawson mines and substantial and permanent improvements and equipment made and constructed by the Dawson Fuel Company during the past fiscal year are of far greater magnitude and importance than any similar enterprise ever undertaken in New Mexico. In capacity, improved appliances, and economical methods this plant is unsurpassed by any in the West, and only in capacity can it be considered as second to any coal-mining plant either East or West. To enumerate a part of these improvements and equipment, the following are the more important: A double trestle, with two tipples and two chutes for loading railroad cars. In connection with the tipples there are stationary and shaking screens for sizing coal for domestic and other purposes; also moving slate-picking table. Alongside the tipples and chutes is located the washery, where slack or other coal is automatically transferred from the screens and chutes, washed, and loaded into the dorries, to be dumped into the coke ovens, situated within a distance of a few hundred yards from the washery. The washery has a capacity of 1,000 tons in ten hours and is equipped with sixteen jigs and the necessary auxiliary machinery to operate them. The power for operating this plant is furnished by two sets of Stirling boilers of a combined efficiency of 500 horsepower. The power to operate the box-car loader and charge the coke ovens will be furnished from the same source. Twenty coke ovens were already completed on June 30, and 104 more are being built as rapidly as possible, the foundations and stonework having been completed some time ago and only awaited the operation of the railroad to transport brick and other

necessary materials. Nearby is located the blacksmith shop, built of iron, dimensions 70 by 30 feet. This shop is now being equipped with lathes, emery grinder, electric drilling machine, bolt and pipe cutting machinery, and blower of ample capacity to run four forges. This department will be in condition to do all ordinary repair work. Power to run this machinery will be provided by a 25-horsepower General Electric Company's motor. The tipple, washery, coke ovens, etc., just described, are located about 1¼ miles south of the mines, the town which is incident thereto being named Eddy, after C. B. Eddy, one of the principal promoters of this great enterprise. At this point also are located the carpenter shop, 30 by 40 feet; storage building, 30 by 60 feet, and seventeen tenement houses. About 2 miles north of Eddy, and near mine No. 1, is located Simpsonville, so called after one of the principal owners in the company. Here are located twenty-eight commodious dwelling houses, built upon modern and pleasing plans of architecture. Five of these buildings are boarding houses, one of four rooms, two of thirteen rooms, and two of twelve rooms. The remaining twenty-three houses accommodate forty-three tenants and their families. These houses are built much after the style of suburban home architecture, pleasing to the eye from without and having modern improvements within.

Dawson is the name of the town, 2 miles south of the mines, where the general offices of the company are situated and where the residences of the superintendent and other officials are located. The town lies in the beautiful Vermejo Valley, which is irrigated by the crystal waters of the Vermejo River. On either hand are seen orchards, which in spring fill the air with the fragrance of their blossoms and in fall are laden with luscious fruits, while the prevailing gentle winds come down the canyon pregnant with the perfume of the pines, which adorn the eroded canyons and the table-topped sandstone hills upon all sides. Deer and wild turkey are to be found within 5 miles of the town, and mountain trout disport in the waters of the Vermejo River, which runs alongside the town. In this ideal location is situated the headquarters of the Dawson Fuel Company. The following enumerated buildings have been completed at the Dawson town site: Twelve dwelling houses; one of twenty-one rooms, one of ten rooms, five of four rooms, two of three rooms, and one of two rooms. Other buildings are in course of construction, among which is a building 90 by 72 feet, which will be occupied as a general store by the Southwestern Mercantile Company. Here also are located the pumping plant and waterworks. An abundance of pure water is obtained from the Vermejo Valley. The waterworks plant consists of a Cameron pump 20 by 30 by 10 inches. The power is supplied by one 60-horsepower tubular boiler and one 40-horsepower Scotch marine boiler. Water is conveyed to different parts of the mines and operating plants by pipe line, and the same mains convey water to all the houses for domestic purposes. This coal-mining enterprise, as a whole, is a remarkable one by reason of the celerity with which it was initiated, installed, and put in successful operation. Just one year ago a western wilderness occupied the sites where now is completed and in operation one of the very largest coal mining plants in the west, with the three towns incident thereto—Eddy, Simpsonville, and Dawson.

PETROLEUM.

Petroleum indications abound, especially in the vicinity of Raton, and work on one oil well is in progress. On the south side of the Raton and Chico Rico mesas is a large area of plain, rolling country, abounding in coal seams, the geological associations of which are most favorable for the presence of oil. This is one of the localities that is now being exploited. Some 16,000 acres have been acquired, and a well drilled to 2,640 feet, when just as indications were most favorable, the well, which had not been cased, began to cave in and had to be abandoned. A new well was begun 5 miles south from this first well and at about 1,600 feet the boring got out of line and the drilling tools were stuck. This boring too had to be abandoned. A third hole is now being drilled and on July 26, 1903, it was down over 1,700 feet. It is cased all the way down, and artesian water has been struck in several strata. Oil in considerable quantity has also been found and the gas flow has been so strong as to ignite upon several occasions, necessitating great care in operating so as not to burn the derrick.

The drill is in the sandstone formation that overlies the oil basins in the Florence, Colo., district. The oil found thus far is the most valuable of all oils, the heavy green paraffine oil that sells from $3 to $5 per barrel as against 15 to 30 cents for the products of the Beaumont and California wells. Experts from both California and Colorado have predicted great results from this oil field, and the instant that the well being bored at present breaks into the oil basin there will be a boom at Raton to rival that of Beaumont.

The table-land consists of sandstone and shales of the base of the Laramie cretaceous and upper portions of the Montana, ridges being formed by volcanic lava dikes, having usually a northeast and southwest direction and which more or less exist in the whole region. The entire plain country constituting the oil field is underlaid with drab-colored shales of the Montana and Colorado cretaceous groups. The sandstone strata constituting the seat of the oil are 3,000 to 4,000 feet below the surface. The basaltic dikes on the surface are thoroughly impregnated with oil and have their cavities and stream holes filled with dark green oil, seepages and oil springs occurring at numerous points in the field, indicating a large underlying oil strata rather than a single spring. There also exist at many points sandstone and shale charged with oil or bituminous matter so that they will burn. Shallow and deep wells of natural gas exist. These have been observed ever since the coming of the railroad, especially on the McCowan ranch, where a man digging a well ignited the gas in the well and was severely burned. At Barela and at Trinchera oil-well-drilling outfits have been at work. There the rock is in places so saturated with petroleum that when broken the oil drips from it like water from a spring. Good indications of oil are also found 6 miles southeast of Springer. The rocks at that place when broken are found to be full of oil cells from which the oil drops. This is a natural gas basin and will no doubt be a producer of petroleum at no distant day.

RAILROADS.

The first railroad to enter the county was the Atchison, Topeka and Santa Fe Railway, which enters at Raton Pass and, cutting through the county from north to south, leaves it at Colmor, a distance of 54 miles. The stations on the line from north to south are Lynn, Hillside, Raton, Dillon, Otero, Hebron, Dorsey, Maxwell City, Dover, Toril, French, Springer, Rayado, and Colmor. The Blossburg branch leaves the main line at Dillon and runs to Blossburg and Gardiner, 5 miles. The Willow branch leaves the main line at Hebron and terminates at Willow Canyon, a distance of 9 miles.

The Dawson Railway, which is a branch of the Chicago, Rock Island and Pacific Railway, enters from Mora County and proceeds northwest, crossing the Atchison, Topeka and Santa Fe main line at French, thence continuing to Dawson, from where an extension westward and northward is planned. Fifty-five miles of this line are in Colfax County.

The Catskill lumber spur of the Colorado and Southern Railway enters the Territory from Colorado near Collins spur and has been extended to Vasquez, a distance of 35 miles in Colfax County. The total railroad mileage in the county is 164.

Several railroads have been surveyed from various points on the main line of the Atchison, Topeka and Santa Fe to Cimarron Valley and up to Moreno Valley and Elizabethtown and across the range to

Red River and Taos, and one of these surveys will probably be adopted and a road built at no distant time. Such a line would be about 60 miles long in Colfax County.

The New Mexico and Pacific Railway was incorporated in 1902, and will build its first link of railroad from Raton to Elizabethtown, the line having been surveyed. This line will open a fine timber, mineral, stock, and coal country.

INDUSTRIES.

The foregoing has given a glimpse of the industries of Colfax County. Gold, copper, and coal are the chief products of the mountains, together with silver, lead, plumbago, cement, gypsum, lime, and oil. Stock raising, agriculture, and horticulture are flourishing industries. There is ample room for creameries, flour mills, cheese factories, tanneries, beet-sugar factories, and other manufacturing industries which would utilize the raw material produced in the county, the fuel, the water power, and the railroad facilities to good advantage and profit, as well as take advantage of the splendid home markets. At Raton there are railroad shops and in the mining camps there are plants for treating the ore. At Gardiner and Dawson there are coke ovens and coal washeries. A concentrator and a smelter are needed at some central point, and would prove profitable. Excellent building stone is quarried in different parts of the county.

FOR THE TOURIST.

Colfax County offers in addition to its superb climate some of the most beautiful mountain scenery in the West, plenty of game and sparkling mountain streams filled with trout. There are vast forests and deep canyons and many other attractions for the lover of nature. The accommodations at the principal settlements are good, and the roads and highways are passable the year around even in the most remote parts of the county.

SCHOOLS AND CHURCHES.

Colfax County is a leader in education in New Mexico. The public schools at Raton are models. Springer has an excellent school system, and every precinct has its school house, which, if not pretentious, is at least substantial and well kept. There are forty school districts in the county outside of Raton, which expend annually $15,000 for school purposes. Raton employs 16 teachers, has a nine months' school term, spends $6,000 a year in teachers' salaries, and has an enrollment of 750 pupils. There are several modern school buildings which are the pride not only of Colfax County but of the Territory. Every settlement also has its church or two, and the social life even in the smaller villages is very agreeable, a decided change and improvement from the rough days and frontier ways which prevailed only twenty years ago.

TOWNS AND SETTLEMENTS.

Raton and Springer are described under the heading of "Cities and towns of New Mexico."

Gardiner, 2 miles from Raton, is the headquarters of the Raton Coal and Coke Company. The population, according to the last census, is 965.

Elizabethtown, the first county seat of Colfax County, was, at one time, the largest and the only incorporated municipality in New Mexico. But the lack of railroads and shipping facilities for the ore from its mines has reduced the population of Elizabethtown from 5,000 to 600. The coming of a proposed railroad will give aid to restore Elizabethtown to its former prosperity. It is a typical mining town and beautifully situated.

Dawson is the second in population in the county, having about 1,500 inhabitants. It is a new coal camp and at the terminus of the Dawson railway. It is surrounded by a good stock and fertile agricultural country.

Van Houten is another new coal camp, picturesquely situated in Willow Canyon. It is the terminus of a spur from Hebron on the Santa Fe Railway. It has a population of almost 1,000.

Maxwell City at one time gave promise of becoming a large town. For a time it was the headquarters of the Maxwell Land Grant Company and enjoyed typical Western boom days. It is still a prosperous settlement, to which a fine stock and agricultural country is tributary. With the building of any one of several projected railroads connecting with the Santa Fe or the Rock Island, the towns of Cimarron and Elizabethtown, as well as Maxwell City, would be benefited considerably, as the road would be built either from this last point or would cross the Santa Fe there.

Cimarron was at one time the county seat of Colfax County and enjoyed its boom days. It now has a population of about 400 and is surrounded by a good stock and agricultural country.

Other important settlements and post-offices with more or less promise for the future are: Rayado, Dorsey, Blossburg, Colmor, Chico, Bell, Kiowa, Vermejo, Aurora, Baldy, Lynn, Osha, Ponil, Rael, Slagel, and Catskill.

OPPORTUNITIES FOR ALL.

There are splendid opportunities in Colfax County for men with big and little capital, for miners, horticulturists, agriculturists, and stockmen, and also for all whose lack of means is compensated for by intelligence, energy, and a strong determination to win out in the battle for independence and wealth. Men who desire to invest in manufacturing industries will find Colfax County an especially attractive field, with promises of great returns on any intelligent investment. The vast beds of coal guaranteeing cheap fuel, the good railroad facilities, the ample water power, the oil indications, the nearness to the markets of the Rocky Mountain States, Mexico, and the Orient, the advantageous climatic conditions and the nearness of the supply of raw material, make a combination which should make certain lines of industry pay handsome dividends. The county can furnish abundant water power by means of dams, which would at the same time form storage reservoirs from which large tracts could be irrigated at a great profit. Iron and steel rolling mills, smelters, beet-sugar factories, tanneries, shoe factories, furniture factories, woolen mills, brick yards, glass works,

are industries which would enjoy especial advantages in Colfax County owing to the cheapness of fuel, the convenience of water power, the abundance of raw material, and the climate, which would make work in industries such as rolling mills, glass works, etc., much more steady and comfortable than anywhere else in the United States.

Especially does the county offer natural facilities for the manufacture and utilization of the raw material found there, and it seems certain to be only a question of time until important industries will spring up as a consequence of such natural advantages. It is for these reasons, taken all in all, that Colfax County is not only one of the most prosperous, progressive, and promising counties in the Territory, but that it is on the eve of marvelous growth that will bring to it a teeming population and great wealth.

FINANCIAL STATEMENT OF COLFAX COUNTY, N. MEX., AT THE CLOSE OF BUSINESS JUNE 30, 1903.

Cash balance January 1, 1903		$31,667.11
Receipts January 1, 1903, to June 30, 1903, tax collections	$64,845.14	
Receipts, other sources	6,837.43	
		71,682.57
Total to be accounted for		103,349.68
Remittances to Territorial treasurer	$22,322.33	
Disbursements for all county purposes	41,560.86	
		63,883.19
Cash balance June 30, 1903		39,466.49

BONDED INDEDTEDNESS.

Title of bond.	Law of issue.	Amount outstanding.	Date of bond.	Rate of interest.	When interest payable.	Place of payment of principal and interest.	Time to run or option.	When due.	Provision for payment.
				Pr. ct.					
Current expense		$7,000	1/18 93	6	Jan.-July	New York.	30-15	1/18/13	None.
Funding	2/28/95	28,900	1 7 95	6	do	do	30	1 7 25	None.
Do		18,000	8/1 97	6	do	do	30	8/1/17	None.
Court-house improvement.	1897	16,000	7/1 97	6	do	do	30	7/7 27	None.
General funding	1899	5,000	9/1/02	5	Mar.-Sept	do	30-20	9/1/32	None.
Total debt		74,900							

PUBLIC IMPROVEMENTS.

Court-house:	
Value of land and buildings	$45,000
Value of furniture and fixtures	5,000
County jail:	
Value of land and buildings	15,000
Value of furniture and fixtures	1,000
Other county buildings: Value of land and buildings	15,000
Bridges	20,000
Total value	101,000

DOÑA ANA COUNTY.

Area, 3,818 square miles. Population, census of 1900, 10,187; census of 1890, 9,191. Since the census of 1900 a portion of the county has been taken toward the creation of Luna County. Present population, 13,000. Assessed valuation, $2,189,899. County seat, Las Cruces.

Officials.—Commissioners, Charles E. Miller, Samuel Geck, Felix Torres; probate judge, Marcial Valdez; probate clerk, Isidoro Armijo; sheriff, Jose R. Lucero; assessor, Theodore Rouault; treasurer, Oscar Lohman; superintendent of schools, A J. Fountain.

Newspapers.—The Las Cruces Progress, Rio Grande Republican, Las Cruces Citizen, El Labrador, and El Tiempo, Las Cruces; The New Mexico Collegian, Mesilla Park.

Post-offices.—Las Cruces, Mesilla Park, Anthony, Chamberino, Doña Ana, Earlham, Mesilla, Modoc, Organ, Plomo, Victoria, Berino, Hatch, Rincon, Garfield.

Doña Ana County has for its south line both the Mexican boundary and part of the northern boundary of Texas, and is situated between Luna and Sierra counties on the west, Otero County and Texas on the east, while Sierra and Socorro counties adjoin it on the north. It contains 2,443,635 acres and is a county almost unrivaled in the variety of its natural resources. Of its area fully one-half is still subject to entry under the Federal land laws. During the fiscal year ending June 30, 1903, 5,250 acres of public land were entered upon, 4,690 acres under the homestead act. The census of 1900 gives it a population of 10,187. It lies almost wholly in the basin of the Rio Grande, which flows through it in a southeasterly direction for a distance of 100 miles, carrying water enough, if properly stored and distributed, to make it a world renowned granary and vineland. The Rio Grande Valley throughout the county has an average width of 7 miles. At its northwest boundary are the Goodsight, Magdalena, Sierra, and Caballo ranges protecting it on the west and north, while the Sierra Oscura, San Andreas, and Organ mountains pass through its eastern portion in a grand and beautiful series of peaks, and abounding in mineral riches. The lights and shades of valley and plain, the rich verdure, the fields of waving grain and alfalfa, the luscious fruits of orchard and vineyard, beautiful to behold in the ever present sunshine, are inspiring indeed, and no man can view them and take note of the truly diversified character of the resources that abound without concluding that there is as yet a country truly undiscovered.

THE MESILLA VALLEY.

The best known region of Doña Ana County is that portion known as the Mesilla Valley. The valley lies at an altitude of 3,800 feet above sea level, just a happy medium conducive to health, and is altogether about 300 square miles in extent, but only a portion of which is at present irrigable and under cultivation. The widest scope of cultivation is surrounding the sister towns of Las Cruces, Mesilla, and Mesilla Park, embracing an area of about 100 square miles. This part of the valley is from 7 to 10 miles in width, bordered on the east by the Organ Mountains, on the west by low hills, while to the north and south

stretches the fertile valley. The soil of the valley is of superior quality. Here orchards come into bearing the second year after planting, and saplings develop into spreading trees with almost magic rapidity. The Mesilla Valley was first settled by the Spaniards about two hundred years ago; but the advent of the people from the States, which was contemporaneous with the completion here of the Atchison, Topeka and Santa Fe Railway in 1881, marked the date of orchard planting and agricultural and general material development, and the beautiful valley has become very appropriately known as the "Garden spot of New Mexico." The fruits grown in this valley, especially its grapes and peaches, have become famous in all the great markets of the Union, and command from the "fancy trade" the highest market prices. Its peaches are simply unexcelled in size and quality, and every variety of grape is successfully grown here, including all sorts of raisin grapes. Grapes and peaches, however, while the most extensively grown for market purposes, are not all the valley produces by any means. Pears, apples, plums, apricots, nectarines, almonds, pecans, English walnuts, and all semitropical fruits are grown here in the greatest perfection and abundance, and alfalfa, corn, wheat, Kaffir corn, oats, and other grains are extensively grown. The wines and brandies made here find ready sale in New York, Chicago, and other eastern cities. The shipment of flowers from Mesilla Park and from Las Cruces is a new and promising industry.

WATER AND PRODUCTS.

Some idea of existing irrigation facilities may be had by commencing in the northern part of the valley and moving south. There are about 4,000 acres under the Loma Parda ditch, about 3,000 acres under the Colorado ditch, about 5,000 acres under the Las Cruces ditch, about 7,000 acres under the Mesilla ditch, not less than 11,360 acres on the San Pedro (Anthony) and San Jose ditches on the east side, not less than 1,200 acres under the San Miguel ditch, not less than 2,560 acres under the La Mesa (Victoria) ditch, not less than 8,200 acres under the Chamberino ditch on the west side, making a total area under ditch of 57,400 acres, although at present only about two-thirds of this land is under cultivation.

The present system of irrigation will at no distant day be supplemented by a more modern system. A company of capitalists a few years ago commenced the preliminary work for a dam across the Rio Grande at a point 70 miles above Las Cruces, known as the Elephant Butte site, for the purpose of backing up the waters of the stream into a great storage reservoir where water for the reclamation of thousands of acres of rich valley and mesa land along the Rio Grande would be conserved and made available during the dry months. Considerable money had been expended on the enterprise when the company was restrained from proceeding further on the ground that the completion of the dam would affect the navigability of the river several hundred miles down stream. It is needless to say that this ground was not tenable—in fact was preposterous.

The Government has now amended its claim, or at least filed a supplementary complaint, and demands a forfeiture of the company's franchise for noncompliance with the law. It is quite probable that this claim may be allowed. If so it will leave the site open for the location of a system of irrigation under the act of Congress. A movement is on foot to have a trustee appointed to secure pledges from

landowners of 50 cents per acre per year for ten years to reimburse the Government in case it decides to build this reservoir, at the expiration of which time the reservoir will be turned over to the landowners. If this project is carried through the water question for the valley will be solved. In view of this many people have filed upon desert-land claims lying on the beautiful mesa between the valley and the mountains. Here are homes for the taking. However, at this writing the Interior Department has withdrawn from entry the public land that would be tributary to a reservoir at the Elephant Buttes.

As "water is king" in the valley, a goodly number of ranchers and farmers are now employing systematic methods of developing it by wells, and pumping plants are now in successful operation.

The recent work undertaken by the Government experiment station at Mesilla Park has demonstrated not only the existence of an immense supply of underflow water in the Mesilla Valley, but the additional important fact that the water can be raised for irrigation purposes at a cost sufficiently low to apply it profitably to almost any crop. The station well has produced a continuous flow of over 1,000 gallons a minute, the diameter of the well being only 6 inches. The cost of a 3-inch irrigation has been about 50 to 70 cents an acre, depending upon the kind of pump used.

Cultivated land in the vicinity of Las Cruces, with water right, may be purchased for from $20 to $40 per acre. This latter figure embraces lands of unexcelled productiveness, such as fields of alfalfa, tracts set to young fruit trees, and grain lands on which two crops a year, one of wheat and one of corn, may be grown. Considering the profits that irrigated land in this valley yield annually, it is easily worth $100 to $200 per acre and will undoubtedly reach a much higher figure than at present at no distant day. Of the land actually under cultivation about one-fourth is this year sown to wheat, one-half is planted to alfalfa, and the remaining one-fourth is devoted to orchards, vineyards, and vegetable gardens. The lands of the county yield an average of from 35 to 40 bushels of wheat per acre. Some claim to have raised as much as 100 bushels per acre. The annual wheat crop of the county, in round numbers, is about 100,000 bushels, of which about 75,000 bushels are made into flour by the mills of the county and the rest is shipped to San Marcial, Socorro, Albuquerque, and Belen.

Flouring mills.

There are six flouring mills in Doña Ana County, with a total capacity of about 290 barrels of flour per day. The first is situated at Loma Parda; owners, Hopkins & Morgan; a burr mill; water power; capacity, about 40 barrels. The second is at Hatch; owner, L. Clapp; part roller and part burr; steam power; and capacity about 50 barrels. The third is at Las Cruces; owner, B. Lucero; a modern roller mill; both steam and water power; capacity, 60 barrels. Also at Las Cruces is the Martin Lohman mill; a modern roller mill; steam power; capacity, 40 barrels. This mill has been in constant operation for the past five years, the last three years running day and night. At Chamberino is a mill owned by F. L. Oliver; a burr mill; both steam and water power; capacity, about 40 barrels. Also one at Anthony; owner, Charles E. Miller; a modern roller mill; steam power; capacity, 60 barrels. The wheat raised in Doña Ana County and the flour produced by its roller mills is equal to the best on earth.

ALFALFA—"A GOOD THING."

Probably 8,000 acres of cultivated lands are planted to alfalfa. It thrives well and yields good returns. It is cut from three to four and sometimes as many as five times per season, and the annual yield per acre is from 2½ to 4 tons, and in exceptional cases as much as 7 tons per acre. The annual alfalfa crop of the county is about 15,000 tons. Part of this is fed to stock at home and the rest is shipped to El Paso, Silver City, Deming, Pinos Altos, Santa Rita, and other Territorial mining camps. Quantities of alfalfa are shipped to more distant points, including Galveston, Tex., for export. Last year fifty or sixty carloads of alfalfa were shipped from Las Cruces to California. It costs $2.25 per ton to raise, cut, bale, and place alfalfa f. o. b. at Las Cruces from these near-by ranches. Owing to the high prices it has been found more profitable to ship the product than to feed it at home. The average selling price last year was $12 per ton, and those who held their product until spring realized an average of $15 per ton. Some received as high as $18 per ton. Alfalfa raising is the most profitable business in the valley. An annual net profit of $20 per acre is a very conservative estimate of the income to be derived from the business by the intelligent, industrious farmer. Oscar C. Snow, the "Alfalfa king," of Mesilla, who graduated from the college of agriculture about six years ago, with no other capital than brains and energy, has made a fortune in the business and now owns 1,000 acres of land in one body, over 600 acres of which is in alfalfa. Frank Kropp has been equally successful in alfalfa farming. The fattening of stock on alfalfa promises to become one of the important industries of the county in time.

A THRIVING INDUSTRY.

One of the large and growing industries of Las Cruces is the canning factory owned and operated by Theodore Rouault. Seven years ago Mr. Rouault started in the canning business. The first year he put up 250 cases of tomatoes and fruits, barely enough to make half a carload. The second year he canned 500 cases. The third year he canned 3,000 cases. Mr. Rouault has 125 acres in tomatoes, and he raises the bulk of all the vegetables and fruits which he cans. Asked if he shipped a considerable quantity of canned goods east, Mr. Rouault, replied:

> No, I do not have to do so. I have a ready market in New Mexico, western Texas, and Arizona for the product of my cannery and, indeed, I can not meet the demand, especially for canned green chili. The greater portion of my goods find a market right here in New Mexico.

This factory has a capacity of 24,000 cans daily, and 75 to 100 hands are employed in the canning room.

He expects to put up 10,000 to 12,000 cans of tomatoes this year, and about 2,500 cans of chili.

The census credits Doña Ana County with 26 industrial establishments with a capital of $137,056, with 182 employees earning $121,387 per year, using $662,204 worth of raw material per year, and whose annual product is worth $944,576.

POINTS OF INTEREST.

So perfect is the climate hereabouts that there are few days in the year that are too warm or too cold to prevent one from enjoying himself in the open air. Among the interesting places within easy drive

of Las Cruces are the old town of Mesilla, 3 miles away, with its surroundings of orchards and vineyards hedged with Osage orange, the agricultural college and college farm, and Mesilla Park, the pretty village near the college. Fifteen miles away, and at the cool altitude of about 8,000 feet, is Van Patten's mountain resort, and it is about the same distance to the mining camp of Organ.

A local writer has this to say of the climate of Mesilla Valley:

The southern portion of New Mexico has been pronounced the ideal climate for persons suffering from lung, asthmatic, or rheumatic trouble, and in fact from any di ease for which a dry, aseptic atmosphere is the perfect panacea.

"The Alameda" is a ranch resort for tourists and health seekers, located a mile and a half from Las Cruces, and is surrounded by alfalfa fields, orchards, and grand shade trees, and has its own Jersey cows, chickens, honey, bees, etc. Dr. J. R. Howes is the manager, and the already popular resort is, under his progressive management, rapidly growing in popularity. The Alameda caters to the patronage of the people who wish to escape the humidity or the severe winters of other portions of the world, and pass the winter months in a dry, mild climate. It provides all the comforts of a home at reasonable rates.

TOWNS.

Other settlements in the county, besides the county seat of Las Cruces described under the head of "Cities and towns of New Mexico," are Mesilla Park, Mesilla, Hatch, Doña Ana (the former county seat), La Mesa, Organ, Rincon, Cambray, Chamberino, Leasburg, Victoria, Garfield, Santa Teresa, Colorado, Anthony, Bosque Seco, San Miguel, and Earlham, whose citizens are engaged in agriculture, mining, and stock raising.

RAILROADS.

The county has about 150 miles of railroad mileage by the Santa Fe route and the Southern Pacific road. They start from El Paso on the south boundary, and the former runs north to Rincon and thence branches southwest to Deming. The Southern Pacific also reaches Deming, thus forming a base of a triangle. To this may be added the El Paso and Southwestern Railroad, which crosses the Rio Grande into Doña Ana County just above El Paso, and runs near the Mexico boundary into Luna and Grant counties, and thence into Arizona Territory. Another railroad has just been surveyed from Alamogordo through Doña Ana County to Deming, Luna County. The survey passes old Fort Fillmore. If constructed as surveyed it will cut off 30½ miles between Kansas City and Los Angeles. Branch lines are to be built from Fort Fillmore to Las Cruces and the mining camp of Organ.

LIVE-STOCK INTERESTS.

The county has about 3,000,000 acres of mountain and table lands, which are devoted to grazing purposes, and furnish grass for horses, cattle, and sheep the year round. Cattle raising receives the most attention, there being 250,000 head in the county. The number of sheep is something over 150,000, and these, with several flocks of high-bred Angora goats in the eastern part of the county, in the Organ and San Andreas mountains, form the basis of a flourishing stock industry. There are still over 2,000,000 acres of land in the county subject to entry under the United States land laws.

MINING INDUSTRY.

Of recent years the mining industry of the county has developed into an important factor of business, the most prominent districts being at Organ, 15 miles east of Las Cruces, on the west side of the Organ Mountain range, at Gold Camp, and in the San Andreas Mountains.

The principal mines of the Organ district, Doña Ana County, are, from the south, the Modoc, the Bennett-Stephenson, the Torpedo, the Copper Bar, and the Memphis. The first two are lead-silver propositions and the last three are copper-silver. The Modoc mine was located in 1879, and although several hundred tons of high-grade silver-lead ore were shipped from the mine previous to the time at which the property was acquired by the present owners, all attempts at working it on a purely high-grade basis had to be abandoned when silver went down. The mine is essentially a low-grade lead-silver proposition, argentiferous galena.

The Bennett-Stephenson was located in 1849, and has since been worked at intermittent periods, producing in all about $500,000. At first mining was carried on in a most primitive manner under the most adverse circumstances. Hostile Indians worried the miners and many a hot encounter took place at or near the mine. Strong fortifications of stone are still standing on the heighths about the mine workings. The ore was extracted by the old Spanish-American method of mining or "coyoting" without the use of powder. The ore was brought to the surface on men's backs. Notched sticks were used instead of ladders. After being crushed between large stones, the ore was transported 16 miles on burros to an adobe furnace near Fort Fillmore on the Rio Grande River, where it was smelted with a loss of about 50 per cent of its silver contents and all of its lead. The ores of this property, too, are argentiferous galena, together with carbonates, sulphurets, chlorides, molybdate, and other allied minerals. There is a small amount of gold occurring with copper. The Bennett-Stephenson is at present being worked by leasers, but the owners will resume operations on a large scale in the near future.

The Torpedo is the best developed and has made the best showing in production. The property was acquired by the Torpedo Mining Company about three years ago and was operated until June, 1902, with a good smelting output. The ores are oxides, silicates, carbonates, and sulphides of copper. The mine was temporarily abandoned on account of a sudden rush of water from the old workings. Five large pumps were submerged. The mine is in active operation again under the management of George E. Fitzgerald, who is running the property for the Federal Copper Company, which has a smelter at El Paso. Since the present management took charge about April 20, 1903, it has shipped 90 carloads of copper ore to the Federal Copper Company at El Paso, making about 5,400,000 pounds. About 60 men are employed at the mine and 47 wagons to haul the ore to the railroad. The ore averages 11½ per cent copper and carries some silver. The ore so far taken out comes from the 150-foot level. Pumps are being lowered to unwater the 250 and 300 foot levels. When this is done 100 wagons will be employed to haul the ore. At levels lower than the 150-foot level the ore is of higher grade. Many of the properties adjacent to the Torpedo will resume operations when the latter has been drained, as they will be also unwatered by pumping the Torpedo dry.

The development of the Modoc mine, previous to its passing into the hands of the present owners, consisted of an inclined shaft, sunk to a depth of 185 feet on the dip. An adit tunnel 90 feet long intersected this shaft at a depth of 95 feet measured on the incline. This tunnel was continued beyond this incline, being in 180 feet altogether. This incline is in ore its entire length and only a comparatively small quantity, rich shipping ore, has been extracted, leaving many hundreds of tons of good milling ore exposed. The vein has an average width of 8 feet.

To develop the mine and prove the existence and extent of the deposits, the present company equipped the mine with air-drilling and hoisting machinery, and commenced operation by sinking a new two-compartment working shaft in barren ground, 100 feet deep, and drifting to the contact. Drifting on the contact the vein was exposed for a distance of 80 feet with the same average width as in the upper workings. The ore is being stoped out above the drift, and a two-compartment winze—at present about 50 feet deep—is being sunk from a point 80 feet from where the ore was first cut by the drift. The winze will be continued, running levels in the vein every 100 feet, with the idea of using it for hoisting from the adit tunnel level when the latter is connected with the 100-foot level by an upraise. The underground hoist (air) now placed on the 100-foot level, at the new winze, will be placed in the adit level and the ore trammed from there direct to the upper terminal of the gravity tram to the mill, which is at the mouth of the tunnel. The mill is at present supplied with ore from the one stope between the 100-foot level and the adit-tunnel level. The ore is trammed from the 100-foot level to the vertical shaft and there raised to the surface—air hoist—and dumped into the bin of the upper terminal.

The air drills used in sinking, drifting, and stoping are the New Water-Leyner, model 5.

The ore is conveyed from the mine to the mill, a distance of 3,490 feet (per line) on cables, with a difference in elevation of 632 feet, by means of an aerial gravity tram—Bleichert system wire-roping tramway. Ore is thus delivered to the mill, at the rate of about 10 tons an hour, at a cost of less than 10 cents per ton.

The concentration mill was originally constructed to treat 75 tons of ore daily by wet process, but the first year of operation being unusually dry and the water supply limited and uncertain, the mill was overhauled and fitted with machinery for concentrating the ore dry. After being reduced by large and small jaw crushers and roughing and finishing rolls, and classified by revolving screens—round trommels—the ore is concentrated on Hooper pneumatic tables. The mill, being originally designed and constructed for wet concentration, has not yet been satisfactorily adapted in detail for dry work. Several shipments of high-grade concentrates (eagerly sought for by the smelters) have been made, and changes and improvements are now being made which will greatly increase the capacity and saving of the mill. A dry concentrator, capable of treating heavier (coarser) stock than the Hooper tables can handle (corresponding) to the jig product in a wet mill is now being installed; also other tables to be used when water is as plentiful as it is this season. When complete, this mill, as the pioneer of its kind, will be a novel and interesting proposition. The Southwest anxiously awaits the completion of the mill and the tabula-

tion of its results, for its success, which seems assured, will mean a great deal to this vast arid region, where many good propositions have remained idle for years simply because they lack water or other means for concentration purposes.

The power plant for the mine and the mill is located in a building adjoining the mill and consists of two 60-horsepower tubular boilers, one 50-horsepower slide-valve steam engine (belted to a 60-light dynamo), and a 16 by 18 (8 drill) Leyner steam-actuated, straight-line air compressor. At present the mill buildings alone are lighted by electricity, but it is the intention also to light the mine, company office, and other buildings, etc., later on. The air compressor furnishes air for the drills and two hoists at the mine, and also, when required, air for cleaning screens, etc., in the mill. The air is transmitted to the mine by a 4-inch pipe with very little loss.

The mine, mill, and company office are connected by telephone, and the office is in direct communication by separate telephone with Las Cruces and the town of Organ, 8 miles to the north. The latter line was constructed and is maintained by the Modoc and Torpedo companies. The wagon road over which concentrates are hauled to Las Cruces, about 14 miles, is firm and smooth, with the exception of the last few miles, near Las Cruces, where it is quite sandy. The altitude of the mine is about 6,000 feet and that of Las Cruces 4,000; the slope is quite gradual. Freight rates to Las Cruces are not excessive.

There are also a number of fine prospects in the Galena Mountains, which are situated in the Black Mountain mining district. These prospects carry lead, copper, and silver. About 3,000 feet of development work has been done on these claims.

In the Gold Camp, on the east side of the Organs, there are large bodies of low-grade sulphide gold-bearing ore. There are a good many claims in this district, though little work has been done on them. The Mormon and Maggie G. groups are now being developed and are shipping ore to the El Paso smelter.

In the San Andreas district a number of copper and lead properties are being developed. Capitalists are becoming interested here and are pushing the work of development.

Another future source of riches in Doña Ana County are the vast deposits of marble. The marble is of many shades and colors and is both fine grained and coarse.

Among the resources of Doña Ana County must be mentioned the phosphate cave near Lava station, in which millions of bats have in past ages and are at present depositing phosphate that is in great demand for the orange groves and orchards of California and is even shipped as far as the Hawaiian Islands to be used there as a fertilizer in the sugar-cane fields.

THE COLLEGE OF AGRICULTURE AND MECHANIC ARTS.

At Mesilla Park, "the promising college town of the Territory," some 2½ miles from Las Cruces, and on the main line of the Santa Fe Railroad, is located the New Mexico College of Agriculture and Mechanic Arts. This institution is endowed liberally by the United States Government and receives annual appropriations from the Territorial government. It is well equipped in all lines. It has a group

of modern buildings, six in number, all of which are unusually well equipped with the necessary machinery and apparatus for the work prosecuted.

CENSUS FIGURES.

The census gives Las Cruces a population of 2,906 and its suburb of Mesilla and Mesilla Park 1,274 people. Doña Ana, the former capital of the county, has 748 inhabitants. Then come the following precincts in order according to population: Colorado, 740; Anthony, 689; San Ysidro, 665; Chamberino, 597; Bosque Seco, 559; La Mesa, 498; San Miguel, 448; Santa Teresa, 413; Rincon, 276; Organ, 259; San Augustine, 96.

Financial statement of Doña Ana County up to and including June 30, 1903.

Cash balance, January 1, 1903		$21,383.73
Receipts, January 1, 1903, to July 1, 1903, tax collections	$21,821.56	
Receipts, January 1, 1903, to July 1, 1903, other sources	3,093.13	
		24,914.69
Total to be accounted for		46,298.42
Remittances to Territorial treasurer	11,196.30	
Disbursements for all county purposes	17,744.40	
		28,940.70
Cash balance, July 1, 1903		17,357.72

Date of issue.	Date of maturity.	For what purpose issued.	Rate of interest.	Amount.
	Years.		*Per cent.*	
July 1, 1899	10-30	Funding bonds	6	$20,000.00
July 1, 1895	10-30	.....do	6	23,100.00
Aug. 2, 1897	10-20	.....do	6	7,173.31
July 1, 1889	10-30	Current expense bonds	6	14,000.00
July 1, 1891	15-30	.....do	6	7,000.00
Total bonded debt				71,273.31
Floating indebtedness				5,426.42
Total indebtedness				76,699.42
The indebtedness of Doña Ana County is offset as follows:				
Due by Otero County on floating indebtedness			$1,642.03	
Due by Luna County on floating indebtedness			2,221.33	
Due by Luna County on bonded indebtedness			9,771.17	
				13,534.53
Net indebtedness of Doña Ana County (funded and floating)				63,164.89

Total assessed valuation, real and personal, for the year 1903, $2,189,899.

PUBLIC IMPROVEMENTS.

Court house:	
Value of land and buildings	$20,000
Value of furniture and fixtures	5,000
Schools:	
Value of land and buildings	6,000
Value of furniture and fixtures	2,800
County jail:	
Value of land and buildings	4,000
Value of furniture and fixtures	1,000
Bridges	12,000
Total value	50,800

EDDY COUNTY.

Area, 6,506 square miles. Population, census of 1900, 3,229; present population, 6,500. Assessed valuation, $1,937,914. County seat, Carlsbad.

Officials.—Commissioners, J. H. James, C. Wilcox, N. W. Weaver; probate judge, A. Green; probate clerk, W. R. Owen; sheriff, M. C. Stewart; assessor, J. O. McKeen; treasurer, J. D. Walker; superintendent of schools, M. P. Kerr; surveyor, B. A. Nymeyer.

Newspapers.—The Carlsbad Argus and the Current, Carlsbad; the Artesia Advocate, Artesia.

Post-offices.—Carlsbad, Artesia, Florence, Hope, McMillan, Malaga, Monument.

Eddy County is the Riviera of New Mexico. It is a garden spot of the great lower Pecos Valley, which extends north and south 120 miles and east and west between the foothills from 5 to 30 miles. It is the most southeastern and lowest in altitude of the counties of the Territory. Its southern and eastern boundaries are Texas. On the west lie Otero and Chaves counties and on the north Chaves County. The area is 4,163,575 acres, or 6,506 square miles—almost equal to that of New Jersey, larger than Connecticut, over three times that of Delaware, and more than six times that of Rhode Island. The Hawaiian Islands, with their population of 119,000, could be placed in Eddy County and not touch the boundary at any point. Of this area 3,600,000 acres, of which 2,250,000 acres are still to be surveyed, are Government land, subject to homestead, desert, or mineral entry. During the fiscal year ending June 30, 1903, there were entered under the Federal land laws 147,440 acres, 49,511 being entered under the homestead act and 35,583 under the desert-land act. The county is the sixth in size among New Mexico counties, the twentieth in population, which, according to the census of 1900, was 3,229, but is 6,500 at present. Carlsbad, the county seat, had a census population of 963; the remainder of the precinct, 1,259; precinct No. 2 had 242 population; No. 3 had 299; No. 4 had 339; No. 5 had 128, according to the census of 1900. The assessed valuation is $1,937,914—a per capita exceeded by only two other counties in the Territory.

CLIMATE.

Eddy County has a mild, dry, and even winter climate and its summers are never oppressive. Its atmosphere is dry and its sunshine percentage is the highest of any part of the United States. The average altitude is 3,400 feet above the sea level and fogs and mists are unknown while snow is of rare occurrence. The average winter temperature is 55° above zero and the average summer temperature 80° above. This is year in and year out with but very little variation. The nights are invariably cool in summer and the song of the mosquito is seldom heard. The following were the monthly average mean

temperatures at Carlsbad in the year 1902, recorded by H. F. Christian, the voluntary weather bureau observer: January, 45.7 degrees; February, 52.9; March, 54.5; April, 67.9; May, 75; June, 83.1; July, 78; August, 79.1; September, 73.5; October, 67.5; November, 54.6; December, 45.4; average mean for the year, 64.7. The salubrious climate attracts each year a greater number of health seekers. Those who have recovered from pulmonary and throat disease in Eddy County are an ever growing host. To the average consumptive Eddy County holds out greater promise of relief and cure than either Arizona or California. Outdoor life is agreeable the year around and there is an absence of oppressive heat and humidity found in tropical climes where alone elsewhere the winters are as mild. The climatic conditions are ideal for tent life, which of late is recommended highly by specialists in pulmonary and throat trouble. The man or woman who can not recover from tuberculosis in Eddy County by outdoor life and observing simple rules of hygiene and dietary, can not recover anywhere else. It is a haven of refuge for the health seeker and its climate is a perennial delight to the well person.

TOPOGRAPHY AND HYDROGRAPHY.

Eddy County is a plains country or rather a plateau sloping toward the southeast. Upon this plateau the Guadalupe Mountains rear their rugged heights on the southwestern border, extending into Otero County and Texas. The foothills of the Sacramento Mountains extend to the northwestern corner of the county while east of the Pecos is a low range of sand hills known as the Mescalero Ridge. South and east of this ridge extends the Llano Estacado or Staked Plain, at one time dreaded as a desert but now the range of many herds of cattle.

The Pecos is the principal river of the county, cutting it in half from north to south and carrying a larger volume of water in its course through the lower Pecos Valley than any other river in New Mexico carries at any point. Its water is slightly alkaline, but on account of the sediment it carries it is a great fertilizer of the land it irrigates.

The Pecos has many tributaries from the west in Eddy County. Starting in the north, the first of these is Cottonwood Creek which is dry part of the year.

The second is the Penasco, which rises in the Sacramento Mountains and flows 40 miles as a fair-sized brook and then entering a piece of marshy land disappears. There is practically no connection between the upper and lower Penasco, except during flood seasons. The flow of the upper Penasco is permanent in Lincoln County and southwestern Chaves County, its surplus sinking in the sands below Hope in Eddy County. In its lower course, springs supply a mean flow of 8 second-feet, which during floods reaches a maximum of 12,700 second-feet. The entire normal flow is consumed during irrigation season. Only 750 acres are under irrigation on this stream in Eddy County, but 4,000 acres are irrigated above Hope.

South of the Penasco, are a number of streams flowing into the Pecos, which are known as the Seven Rivers. They rise in small springs in Eddy County. The combined normal flow is about 20 second-feet, but reaches a maximum of 7,500 feet during the rainy season. There is a surplus of about 5 second-feet from these streams which is lost in seepage.

South of Seven Rivers is the Rocky Arroyo, which rises in the Guadalupe Mountains and is permanent in its upper portions but sinks in the gravel below. Its normal flow is about 10 second-feet, with a flow during the floods of 1,200 second-feet. Practically all the water is consumed in irrigation, but there is a small surplus which is susceptible of use.

In Dark Canyon, the stream south of the Rocky Arroyo, the same conditions are met, but its normal flow is only about 5 second-feet while its flood flow reaches 14,000 second-feet. All the normal flow is consumed.

The Black River drains a portion of the eastern slope of the Guadalupe Mountains. The river is 35 miles long, but is a small stream to within 16 miles of the Pecos where its volume is considerably augmented by the Blue River formed by several large springs. It flows through a series of lakes and is subject to extensive floods on account of the large area drained. Its normal flow is about 20 second-feet, while in floods it reaches a maximum of 5,000 second-feet, Only about one-half of the normal flow is in use on this stream. Grapevine Creek is a small tributary in its upper course.

The most southerly tributary of the Pecos in Eddy County is the Delaware, which rises in Texas and has but a small normal flow.

The entire absence of tributaries on the eastern side of the Pecos is very striking and is due no doubt to the pervious character of the soil of the Staked Plains upon which no drainage system is established. The only supply of water which the Pecos receives from that side comes from a few small alkaline springs and from a small arroyo which carries water once or twice a season.

The constant, never-failing supply of water in the Pecos comes from springs which must receive their supply from a great distance. This is owing to the peculiar structure of the country and the prevalence of the easily dissolved limestones, which permit the waters to make underground channels for themselves and thus flow for considerable distance out of sight. Many reservoir sites are found on the Pecos and its tributaries and it is probable that 70,000 acres more in Eddy County, besides the 200,000 acres under ditch by the Pecos Valley Irrigation Company, could be irrigated by utilizing these sites and even without storage 20,000 acres more than the present acreage could be irrigated. Only about 20,000 acres are under cultivation in the county.

IRRIGATION

Eddy County's magnificent irrigation system is at the foundation of its prosperity, yea, its very existence. It has two of the largest bodies of storage water in the arid regions. One is known as Lake McMillan, 18 miles north of Carlsbad, and the other as Lake Avalon, 6 miles from Carlsbad, both formed by damming the Pecos River, which rises on the Pecos forest reserve and embraces a watershed 200 miles long and averaging 75 miles in width until it reaches Carlsbad. It cuts the county from north to south near the center and is the source of supply of New Mexico's most famous irrigation system. From Roswell, 90 miles north of Carlsbad, for more than 100 miles south, the Pecos is fed by innumerable artesian springs, whose flow never varies with the seasons or with local weather conditions. Through all this vast area not a storage reservoir can be built, not an artesian well can flow

THE NEW CONCRETE FLUME OVER THE PECOS RIVER.

THE SPILLWAY OF LAKE AVALON RESERVOIR.

without increasing the water supply of the Carlsbad canals. A river so fed can never go dry at low stage, while at high water the flow often amounts to 20,000 cubic feet per second, three times the maximum flow of the Cache la Poudre in Colorado, where 150,000 acres are under irrigation. The damming of this river has created the two immense reservoirs mentioned above, which have a capacity of 90,000 acre-feet, Lake McMillan being 13 miles long and Lake Avalon 7 miles long and from one-quarter to 1 mile in width. The piers, headgates, and wasteways are built in masonry and are practically indestructible. Such a thing as a breakage of the dams on either lake is impossible on account of ample spillways.

From the more southerly reservoir, Lake Avalon, starts the magnificent irrigation canal of the Pecos Irrigation Company. The canal is 45 feet wide at the bottom and carries 2½ feet of water in depth to the berme, and with banks 8 feet high. Two and one-half miles north of Carlsbad this canal is divided, and one fork is carried to the west bank of the Pecos in a massive concrete masonry aqueduct 492 feet long, 47 feet high, and with a capacity of 4,000 cubic feet per second; sufficient to irrigate 250,000 acres of land. The river is spanned by four concrete arches 100 feet long and 25 feet high. The only material other than concrete used in this structure is 1,600 linear feet of steel rails built in the concrete floor and sides of the aqueduct proper and tied overhead every 4 feet to carry the weight of water and keep the sides from spreading. This aqueduct was designed and constructed by Thomas T. Johnston, civil engineer, of Chicago, the famous inventor of the Bear-trap Dam in the Chicago drainage canal, constructor of the Economy Light and Power Plant at Joliet, and of the city waterworks of Memphis, Tenn. This aqueduct cost $45,000 and was ready for irrigation this spring. This is a new departure in irrigation engineering and is attracting the attention of Government experts and engineering circles throughout the United States. The canal is in active operation for a distance of 25 miles, and embraces with its life-giving stream over 100,000 acres. There are 500 miles of distributing canals, not including the small farm ditches. The two dams, each over one-fourth of a mile long and nearly 50 feet high, built of loose rock, with their massive headgates set in masonry, and their huge spillways to carry off flood waters, are a never ceasing source of wonder and admiration to the casual visitor, the expert engineer, or the drought stricken homeseeker from less fortunate surroundings. One has to go to Egypt or to India to see irrigation works that surpass them.

These large bodies of water furnish the Pecos Valley with such an amount of water as, even in dry seasons, has enabled it to raise as large alfalfa and fruit crops as were ever known from a single section in the arid regions. The waters of the Pecos are full of sediment, carried down from the mountains and thence deposited in the canals and ditches, that not only irrigate, but also fertilize the rich lands which border the river from Roswell to 40 miles south of Carlsbad. It is a strange feature of this great river that, although it does not sink and then reappear as is the case with many southwestern streams, notably the Red River and Canadian, its bed for miles is simply a bed of springs. Not the small seepage springs that one looks for in the streams and water courses of the North and East, but huge affairs, emitting sufficient water in many places to produce a river by their

own flow. For instance, the great spring at the head of the Blue River, known as the Blue Spring, furnishes not only water enough to irrigate 2,000 acres of land but forms a small river which falls into the Black River 20 miles south of Carlsbad.

Lake McMillan and Lake Avalon are the insurance of a stable water supply against a season of unusual drought; but seldom is it necessary to draw upon them, as the ordinary flow of the Pecos is sufficient for all requirements. During the first six months of the year 1901, for instance, nearly 100,000 acre-feet of flood water were allowed to pass down the river, April being the only month that water was not allowed to spill at the dam. When one remembers that this was a year of disastrous drought elsewhere and that the local rainfall for the six months was only 3.6 inches, no argument is needed to convince the most skeptical of the adequacy and permanency of Eddy County's water supply.

In the year previous, 1900, there were 8,646 acres in cultivation under the system and made profitable by the irrigation system, divided as follows: Alfalfa lands, 3,843 acres; corn, 3,660 acres; cane and forage plants, 554 acres; orchards and vines, 359 acres; gardens, 589 acres. During the season the irrigation company supplied to the farmers 28,786 acre-feet of water. An acre-foot of water means 12 inches of water placed on an acre of land. In 1902 there were in cultivation 15,000 acres under this system.

With all the vicissitudes that this great corporation has been called upon to encounter during its existence, never has the farmer been able to complain that his crops failed because of negligence on the part of the company or a lack of water. Land values have increased nearly 100 per cent during the past year. First-class lands now bring readily from $30 to $50 an acre. The water right is sold with the land and the yearly water tax is but $1.25 per acre, said to be the lowest in America for the service rendered.

Construction has been also begun on the Four Mile Irrigation Company's dam northwest of McMillan. The site is a large natural depression, entirely surrounded by hills, save at one narrow place where floodwaters have cut a passage through the solid rock. A short dam will be thrown across this canyon and thus a reservoir holding millions of gallons of water will be created. The Four Mile Draw which feeds the reservoir is 75 miles long and heads in the Sacramento Mountains. Several artesian wells will also be bored to augment this water supply. The plans for this reservoir were outlined by Thomas T. Johnston, who made the plans for the big concrete flume across the Pecos. It embraces the construction of an earth dam riprapped with rock on its surface. There is a natural spillway which will handle all the floodwaters without further work. Instead of the usual clumsy and perishable wooden head gates, the dam will be pierced by 1 foot steel pipes, set in solid cement castings, with automatic steel straps to control the egress of the water. The reservoir will supply water to irrigate several thousand acres of virgin soil, considered to be among the richest and most fertile in the Pecos Valley.

At Artesia, formerly Stegman, so called from the flowing wells recently discovered, which rival the volume of, if they do not exceed, the famous artesian wells near Roswell, the country is being rapidly settled by the homesteader and under the desert-land act. From a distance of 25 miles from the Chaves County line south not a quarter

section is now available for entry on the west bank of the river for 6 miles back. It is believed that in other parts of the county artesian water will be struck sooner or later, and even far back from the river water is found at moderate depth and is available for irrigation or stock watering by pumping.

AGRICULTURE.

Necessarily the conditions described make agriculture a success. Given a mild climate, a high percentage of sunshine, and ability to water the land when it needs it and to withhold moisture when not needed, there must be maximum crops, and there can be no crop failures. Alfalfa and kaffir corn are the staple but by no means only crops of Eddy County. Anything that can be raised in the temperate or semitropic zones can be raised here.

Alfalfa is cut four times and in some instances, in small fields, five times a year. In addition, it furnishes considerable pasture, often, owing to the mild climate, throughout the winter. As high as 2 tons per acre have been harvested at one cutting. A good average on the large ranches is 4 tons for the season, while on the smaller fields often 6 tons per acre are cut. One hundred and twenty acres sown in October and November were cut for the first time on June 24 of the following year. Eighty-three tons were sold at $8.75 per ton, baled and delivered in Carlsbad, commencing July 7. One of the sections, the earliest planted, containing 36 acres of land, cut 43 tons. These are actual weights, and comparison is challenged. August 5 this alfalfa was cut the second time. The best time to sow alfalfa is in August or in September. Where properly cared for and not over pastured, this is a permanent crop. Like all clovers, it is a soil renovator and enricher, and when plowed up, a great increase in the productiveness of the soil, even reaching 50 per cent, is noted. The cultivation of this crop has made potato growing possible in Colorado. Together with kaffir corn, it is the sheet anchor of Kansas in time of drought. Under irrigation it thrives best, but it needs oceans of water for maximum results. Alfalfa hay, baled from the windrow, sells at $8 and upwards f. o. b. cars and in Carlsbad. Ten dollars per ton is the average winter price for prime hay.

In the following letter D. S. Horton relates his experience, which is only a typical one:

I have lived near Carlsbad for ten years, working at first for wages. I lost my savings in an unfortunate venture, and five years ago began farming, rented land with a partner, my only capital being a wagon and team. We have farmed 300 acres annually, chiefly in kaffir corn and Milo maize. The yield has been from 1 to 1½ tons per acre in the head, and it has sold from $9 to $12 per ton, delivered in the head. I rented an extra good 25 acres of alfalfa. It has cut from 1 to 1½ tons per acre to each cutting, four cuttings to the season. I pasture very little, not to exceed thirty days, and take everything off before January 1. I do not pasture in the spring. I figure kaffir corn costs me to raise as follows: Planting per acre, $2; two irrigations, 50 cents; heading, $1.25; piling in the field, cutting, and shocking stalks, $1.50. An ordinary crop should make 4 tons of fodder per acre, and sells at $4 to $6 per ton shocked in the field. My share of the proceeds of these three years' farming has enabled me to pay $950 on the place I now occupy, while I own, free and clear, seven heads of horses, a cow, hogs, poultry, and all farming implements necessary to work constantly two heavy 3-horse teams, and I have money to carry me through another season.

P. S. Since the above was written, I have purchased another 40-acre tract.

Eddy County is the best corn county in New Mexico. Kaffir corn and Milo maize are the grains chiefly cultivated, and they grow to a height of from 6 to 8 feet, producing from 30 to 50 bushels per acre and selling at 75 cents per 100 pounds, threshed at harvest, or $10 per ton in the head. Wheat will yield 20 bushels to the acre on raw land and 45 bushels an acre on good land, and sorghum, rye, and barley in proportion. Asparagus, celery, peanuts, cantaloupes, watermelons, sweet and white potatoes, and all varieties of garden vegetables, including the egg plant and the southern okra or gumbo, are as productive as they are mature in growth. But vegetable growing has been neglected. Conditions of climate and the fact that rainfall comes in the summer and not in the spring, thus necessitating the germinating of seed by irrigation, makes market gardening somewhat difficult for the average farmer, but the reward of success is great. Prices are naturally high and the market almost unlimited, reaching out for 1,500 miles north, south, and east. Potatoes, turnips, cabbage, and beets sell at 1½ to 4 cents per pound. Lettuce, radishes, and spinach are practically unknown the greater part of the year, whereas the climate is such and the conditions so favorable that, with a little protection, they can be produced all winter. Onions, potatoes, peppers, melons, squash, asparagus, and celery grow almost like weeds and respond to the slightest cultivation. The local market is overstocked during a short season by these products, but the adjacent markets are not touched, and thus far but little effort has been made to extend or anticipate this outside demand. Money awaits people who will engage in the cultivation of these apparently small avenues to wealth. There is just enough salt in the water to admit of asparagus growing rank. Colorado Springs pays 30 cents a pound for it. The same can be said of celery. It needs little or no cultivation and the results to the grower are large. It ripens earlier and lasts longer in Eddy County soil than does either the celery of Michigan or that of California. The market for these two profitable products of the valley are Denver, Colorado Springs, Kansas City, and even St. Louis and Chicago.

The Eddy County cantaloupe industry is in its infancy, in fact, has just been born. The future of the industry, however, can be gauged from the fact that in the Barstow, Tex., region, 90 miles south, and on practically identical soil and closely kindred climatic conditions, last season's crop returned $40,000 from a planting of 200 acres. The flavor of the Eddy County cantaloupe is equal to that of the Rocky Ford, the carrying capacity from two to four days longer, while the earlier season and the fact that it can be prolonged to October 20, the date of the first known frost, assure the best of prices.

The ordinary farmer will not give attention to the garden. In Eddy County he is chiefly interested in stock. The market gardener thinks he must seek the vicinity of some large city for his market. Thus a great portion of the West must import its vegetables, and a profitable and a constantly growing market is neglected. The lower Pecos Valley can meet this demand and should control it. How long shall it wait for the enterprise and the skilled labor with which to do it? There are fortunes here for the men who will produce asparagus commercially in this, its natural home, and put it on the northern market, as can be done, by March 10 of each year. It is the same with other products of the truck farm.

Cotton is being grown and 2,000 acres were planted this season by parties who came from Barstow, Tex., where they have been cultivating this crop successfully for six years. The same parties will have a gin operated by water or electric power ready for the crop of 1903. There is no boll weevil in Eddy County. The crop will average about three-fourth of a bale per acre. The total investment, land leasing, raw-cotton purchase, gin building, and operating and wages for labor will reach $40,000. The cotton will be what is known as fine middling, bringing 7 cents per pound, or between $30 and $40 per bale. Other gins will be erected as needed, and in the course of the next three years it is expected that Eddy County's cotton culture will cover 10,000 acres. Irrigated cotton yields one-third more per acre than rainfall croppage, with the same proportion of additional fineness in commercial quality. The cotton seed will sell at $12 per ton for stock-feeding purposes, while a future adjunct of Carlsbad cotton will be an oil-cake plant.

The sugar beet attains great size, a high percentage of sugar content and extraordinary purity in Eddy County soil, and under favorable conditions yields two crops a year. The yield per acre is heavy, and as soon as the necessary labor is available to attend to the cultivation of the beet fields and another beet-sugar factory is built to replace that burned down, the sugar beet will be quite a wealth producer in the southern Pecos Valley.

HORTICULTURE.

Santa Fe County alone can rival Eddy County in variety and excellence of fruit products. Apples, pears, peaches, plums, prunes, cherries, quinces, and grapes bear in profusion fruit of the largest size, the highest coloring, the most perfect flavor, and owing to the comparatively low altitude it ripens two weeks earlier than in any other part of the Territory excepting the Mesilla Valley. The fruit orchards, young as they are, show every evidence of becoming in time one of the greatest resources of the lower Pecos Valley. At present it is not so much the magnitude but the quality of the crops that commands attention. Peaches ripen early and attain a size equal to the largest peach grown in California, and possess a flavor not excelled by fruit grown anywhere else. An acre of land has room for 108 peach trees, when planted properly, and at the age of six years the crop from each tree, if properly handled, will be worth $9, without deducting the expense of irrigation, labor, and other items, which will be probably $4. This of course takes into consideration only good years, for the valley, in common with other sections, must make allowance for late frosts; but as to fruit pests, it may be said that thus far the orchards are without them. The absence of these bugs and worms is attributed to the dry atmosphere, that is not congenial to the propagation of these harmful insects, which devastate the orchards of the North and of the West. A six-year old orchard of peach trees, of 20 acres, may rightly be considered as an independence to the man who will properly care for it. Experience has taught that care must be taken to choose the late-blooming varieties of pears, peaches, and plums. The orchards are old enough to serve as a guide in selecting the best varieties for new orchards.

It is no uncommon thing—in fact, it is more or less the rule—for the orchardist to denude his trees of at least one half of the fruit that

clusters on the branches, as, in the case of peaches, no tree can hold the ripe fruit that a favorable season places on the limbs.

The Elberta is the leading variety among the peaches. It reaches a weight of from one-half to 1 pound. This peach is at once as firm and as delicate in flesh and delicious in flavor as it is preponderant in weight and is a fine shipper, appearing on distant markets in all of its original blush and perfection. As an illustration of the Carlsbad peach values, one owner received last year about $3,000 from the yield of 600 trees. One of R. M. Love's trees has been christened "The Teddy," because from it a box of peaches was sent to President Roosevelt. The box contained peaches which averaged a pound. In 1902 F. G. Tracy's orchard of 4.71 acres sold $2,070.18 worth of peaches, or a yield of $439.53 per acre. The expense of picking and boxing was $148.67 per acre, leaving a net profit of $290.86 per acre.

The Alexander and the Chinese Clingstones are also fine varieties that do well in Eddy County. They are prolific bearers and good shippers. The Pecos peach is free from blotches, specks, and worms, and one tree last year made the record of producing $30 worth of fruit. R. M. Love wrote the following letter about his peach orchard to Stark Brothers' Nurseries and Orchard Company:

GENTLEMEN: Replying to your favor of the 9th, will say that from 60 trees purchased from you, planted eight years ago, we sold this season 450 20-pound boxes of peaches, which brought us $400 in cash, or an average of $6.66 per tree or 88 cents per box. Most of the crop was sold in the Colorado market at from $1.10 to $1.40 per box, while California and Colorado peaches were selling at from 60 cents to $1. We plant our trees 20 by 20 feet, which gives 108 per acre; this would give a yield of $720 per acre, and would easily net between $300 and $400 per acre. To show the possibilities of the peach on this deep, sandy loam, will say that one tree of an early variety yielded 500 pounds, which netted $20 cash; 17 trees of the same variety two years ago gave us $9 per tree, or at the rate of $972 per acre. It is possible for land to have a value of from $50 to $100 per acre grown in cereals. It is much better, however, for the same land to become worth from $500 to $800 per acre by being planted to $300 net per year peaches or apples.

R. M. LOVE.

The apple is a close second to the peach as an Eddy County orchard favorite and trees yielding 1,000, 1,200, and 1,500 pounds of perfect Ben Davis apples are just coming into bearing. The Shackleford, the Missouri Pippin, the Arkansas Black, and Geniton are other varieties that yield good crops. The lower Pecos Valley appears to be their natural home. Frost rarely troubles the blossoms and the codling moth is yet an absent factor. A specked apple is an unknown quantity. The fruit is large and firm, some orchards producing apples that measure 15 inches in circumference and compare favorably with any apple raised in the United States. There has not been a failure in the apple crop in the history of the valley.

Pears and prunes do well, and so do strawberries and other small fruit. The Bartlett pear especially finds a congenial home in this soil and with proper cultivation success is certain.

Almost 10,000 fruit trees were planted in Eddy County this spring and orchards are beginning to line the miles and miles of irrigation canals.

The culture of the Russian mulberry is quite successful. It is a phenomenal bearer. H. R. Wilson has thirteen of these trees at Carlsbad and he gathers 50 bushels of berries from them annually. The price they command would give their crop value at $2,000 an acre.

Pecan, walnut, and other nut trees thrive and are big money makers when in bearing.

Pecos grapes are alike of table, wine, and raisin growth, and include the Tokay, Delaware, Muscat, Catawba, and Seedless Sultana.

The world is the market for such fruit as Eddy County raises, and its shipping qualities carry it safely anywhere within 1,500 miles of Carlsbad.

LIVE STOCK.

The raising of live stock was a great industry in the lower Pecos Valley before any other industry was thought of. As far as capital invested and value is concerned, it is still the leading industry of that section. For every acre under cultivation there are 300 acres of grazing land. Eddy County, owing to its mild climate and its water supply, is a stock country par excellence. The altitude below the foothills of the Guadalupe Mountains, which are situated in its southwestern part, is 3,200 feet, the lowest in the Territory. The plain from these foothills extends 95 miles east and 66 miles north and south. The Pecos River bisects it a little west of the middle. Over all of this vast free range roam large herds of cattle and flocks of sheep. An abundance of water is found at depths varying from 20 to 400 feet. Windmills dot the country, and practically every available acre of grazing land is occupied by stock. The future growth of the live-stock industry must be made in improvements of the herds, and the irrigated ranches must furnish the stock to do it with. The Pecos Valley and its vicinity present to-day more inducements for the breeding of fine cattle than any one known district in the Southwest, with its sheltered location, its utter freedom from blizzards and absence of extremes in heat or cold, and above all, its abundant water. These advantages have been utilized by men like Col. C. C. Slaughter, Gen. R. S. Benson, and other breeders of fine cattle, and they have established their stock farms in the lower Pecos Valley, and are now producing as fine and as clean bred Herefords and Shorthorns as can be found anywhere in the West. The time is not far distant when all the larger farms now devoted to miscellaneous agriculture will boast of thoroughbred herds, the product of which will go to improve the stock on the immense cattle ranges of the Staked Plains east of Eddy County as well as the western Panhandle country.

On General Benson's Tansill farm of 800 acres 1,500 head of cattle are wintered annually, and there high-grade bulls, bred by registered Hereford bulls upon full-blood Durham cows, are annually prepared for market. Mr. Benson's last year's crop of calves sold this April for $65 per round, no cut backs, all to one outfit in Arizona. W. H. Mullane, W. W. Galton, and H. E. Galton each have herds of registered Red Polled cattle as good as any to be found in the older States.

Owing to the abundance of water for irrigation purposes, the lower Pecos Valley is able to furnish feed for the thousands of thoroughbred cattle for building up the surrounding ranges, while the mild climate, free from northers, not only assures practical immunity from winter losses on the range, but produces growth at about half the cost and far more rapidly than in colder places where winter feeding is practiced. About 30,000 head of steers, chiefly 2-year olds, were sold this spring from Eddy County ranges for future beef, maturing on South Dakota and other northern grasses. Between 20,000 and 30,000 head

of grass-fattened beeves will leave the southern Pecos ranges this fall, while 15,000 to 20,000 head of yearlings will be for sale at from $15.50 to $16.50 per head. The Eddy County cattle are generally bred into close Hereford grades, thus giving alike blood, bone, and beef.

At the Bolle's farm, W. P. McIntosh, jr., manager, 760 acres. 6 miles south of Carlsbad, old-range cows, too poor to winter on the range, are bought in the fall and wintered on alfalfa, to go fat to the block, or to produce calves, thrifty and healthy, worth from $2 to $5 per head more than those of their less fortunate companions. I. S. Osborne, on his 1,100 acres, confines his attention to the fattening of steers, at an average profit in three months of $20 per head.

Eddy County has over 200,000 head of sheep well graded to Merino and Shropshire strains, thus covering a wool and mutton cross. Heavy yearling mutton feeder sales are made to Texas fattening pens at from $2.25 to $2.50 per head and the Colorado buyer can find from 5,000 to 10,000 head of fine lambs in the market every spring. The Eddy County fleeces scour out 7½ pounds and class in the market as fine medium at 10 cents. The annual wool product amounts to nearly 1,000,000 pounds. George H. Webster, jr.'s, Vineyard stock farm of 640 acres, 3 miles south of Carlsbad, offers a practical example of what can be done in feeding alfalfa and kafir corn to lambs and hogs. Shorn lambs fed one hundred and ten days on one-third less grain than in Colorado, shorn thirty days before shipment, topped the market at 88 pounds at $7, at a season, March 14, when Colorado could not pretend to ship shorn stuff. Mr. Webster has been experimenting with kafir corn and milo maize, both of which are grown abundantly in the county, as a substitute for indian corn for fattening lambs, and the result has been satisfactory. No loss was experienced from indigestion, the lambs took readily to the feed, and their progress was almost phenomenal. It might seem as if there would be a large shrinkage of weight and value in getting the lambs to market, but Mr. Webster says that his lambs reach Kansas City without loss or inconvenience and with a shrinkage of not full 3 pounds per head, despite the 900-mile haul, and that he succeeded in topping the market; that the killing test at Kansas City averaged as high as 54 per cent, and the flesh was pronounced fully equal to that of the finest indian corn fed lamb. Mr. Webster is feeding 9,500 head of lambs this year. He has equal success with fattening hogs on home-grown alfalfa and grain; in fact, hogs do exceptionally well and there is a big profit in raising them. They are not subject to cholera as in other sections, and hog raising is destined to be quite an important industry in Eddy County.

BEES.

That Eddy County offers a fine field for the apiarist is shown by the following letter written by Edward Scoggin:

I commenced in 1894 with 10 colonies; now have 135 colonies. This is not an exceptional or more than a common increase; but I wish this distinction clearly noted, that I am not a bee keeper. I let the bees keep me. I paid expenses from the first, and after attaining to 50 colonies the income was sufficient to furnish my living. The net income from each colony, spring count, can be conservatively placed at $5. I estimate my gross income this year from the 135 colonies at $1,100. The wholesale market price of strained honey ranges from 6⅔ to 7½ cents a pound, and comb honey 10 cents and over a pound. Markets are good, there being demand for all honey produced. I have on my farm 200 acres in alfalfa, corn, and sorghum,

and with the assistance of one man attend to my crops and bees. In the early spring the bees feed on mesquite blossoms, then on alfalfa blossoms, and on wild flowers in the fall. Winter feeding is not necessary. For a conservative, careful man the bee industry in Eddy County offers good opportunities for profit.

LANDS.

All land in Eddy County, except that embraced in the irrigation districts of the Pecos Valley and that occupied by actual settlers, belongs to the United States and is subject to entry under the homestead and desert land laws, there being 4,000,000 acres in the county available for that purpose. Irrigated lands can be bought at from $25 to $100 per acre, according to locality and improvements. Patented lands without any water rights are sold as low as $2.50 to $5 per acre. Interest on farm mortgages is only 6 per cent. The so-called Beales grant, laying claim to a large area, has been declared fraudulent by the United States Supreme Court, and the drift fences erected by cattlemen, primarily to keep their herds from straying, but also at times, incidentally, to keep out newcomers and settlers, are rapidly being torn down.

MINERAL WEALTH.

Eddy County is not classed among the mining counties of the Territory, yet its indications of mineral wealth are very promising. Especially in the southwestern part considerable success has followed the prospecting for gold and copper ore. In the Guadalupe Mountains, about 35 miles southwest of Carlsbad, some development work has been done and quite a number of claims have been located. The old Nymeyer copper mine, in the Guadalupe Mountains, has been recently purchased by the Standard Oil Company of Carlsbad, and a contract for a 500-foot shaft has been let. It is confidently predicted by experts that this work will develop a fine body of mineral.

It had been known for some years that oil indications existed from the Texas boundary to north of Carlsbad. Soon after the Beaumont oil excitement California parties began prospecting for oil and located 440 acres of placer oil claims within 4 miles of Carlsbad. The town went wild with excitement and thousands of acres were located and assessment work done upon them. Companies were formed and incorporated, stock was issued, and all steps common to an oil excitement were taken. It has remained, however, for the Standard Oil Company, incorporated by local and partly by Iowa and Nebraska people, to go ahead steadily, to realize $25,000 from the sales of stock, to buy a standard oil drilling machine in Pittsburg, and to import experts to run it. This well is down 1,500 feet and work has been stopped temporarily on account of water. The prospects are most promising. The oil is there. The capping appears to be impervious and hopes of finding oil in paying quantities are high. Indications of oil are found up and down the Pecos from Seven Rivers on the north to Fort Stockton on the south, more than 150 miles, but thus far the only good cap rock is that found in the foothills near Carlsbad. Accessibility to the railroad would make an oil strike there particularly valuable.

INDUSTRIES.

The foregoing indicates what industries would be the most likely to flourish in Eddy County. The lack of fuel is made up for by the

splendid waterpower which the Pecos, its tributaries, and the larger canals afford. The wool-scouring mill at Carlsbad has handled about 1,500,000 pounds of wool annually, but was removed to Roswell this year because the latter place seemed to offer an even better field. But nevertheless such a plant should prosper at Carlsbad. A creamery, cheese factory, cannery, woolen mills, cold-storage plant, ice factory, tanneries, breweries, all should do well. A flour and grist mill is very much needed. The cotton gins to be erected this year will doubtlessly be followed by others as the acreage in cotton expands. Carlsbad had the only sugar factory in New Mexico, but it burned down recently just as a colony of sugar-beet farmers was to be established to supply the factory with an adequate quantity of beets. Carlsbad has bottling works and an electric-light plant. A broom factory would flourish, and a variety of smaller industries would find great inducements, good markets, and favorable conditions for prosperity.

Sooner or later an electric railway will skirt the Pecos River from Roswell down to the Texas line and the present excellent transportation facilities will be even better.

RAILROADS.

The Pecos Valley and Northeastern Railway, a division of the great Atchison, Topeka and Santa Fe Railway system, cuts through the county from northeast to the south, a greater part of it following the river, having its present southern terminus at Pecos, Tex., and its northern terminus at Amarillo, in the same State, where it connects with the Kansas Southern Railroad, the Choctaw, and the Colorado and Southern, thus giving Eddy County direct and ample connection with all parts of the United States. The railroad company is doing much to further the industrial growth of the Pecos Valley, and is advertising it extensively. The mileage in the county is 75. The following are the freight rates from Eddy County points: Beef cattle to Kansas City, 41 cents; sheep, double deck, 40 cents. First, second, third, and fourth class freight to Carlsbad, from Kansas City, $1.80, $1.64, $1.54, $1.48; St. Louis, $2, $1.78, $1.62, $1.55; Chicago, $2.20, $1.94, $1.74, $1.65.

FISHING AND HUNTING.

Eddy County, in addition to its climate, offers many attractions to the tourist and the visitor. Not the least is the sport that it affords to the hunter and the angler. Black bass of the small-mouth variety abound in the Pecos River and its tributaries. These game fish were first planted in 1892 and have multiplied and thriven wonderfully. Many fish have been caught which exceeded 5 pounds in weight and 3 or 4 pounders are plentiful. The bass begin biting freely in September and the sport continues to improve right up to cold weather. Besides bass, blue channel catfish are caught in all the streams and lakes. They are, in these waters, nearly as gamey a fish as the bass. Rock bass, goggled-eyed perch, and huge yellow catfish, that often weigh as much as 30 pounds, are also caught. Perch and sunfish are plentiful and are becoming more so yearly, as the citizens of the county closely observe the New Mexico game laws.

The Pecos Valley, in the vicinity of Carlsbad, is, for certain kinds of game, unequaled in the Southwest. There is practically no limit to

teal and mallard ducks that visit the valley every winter and remain from October to April. English snipe, or jacksnipe, as they are known in the North, are plentiful from October to May. It is no unusual feat for one man to bring in 100 birds as the result of a single day's hunt. Quail and doves are almost numberless. In the deeper ravines wild turkeys are found.

For larger game the great Staked Plains to the east and the Guadalupe Mountains and foothills to the west have always been famous, and probably always will be. While the buffalo has disappeared, yet the panther, bear, deer, antelope, and mountain sheep still abound. The large lobo wolf and coyote are met with frequently. However, the sportsman should acquaint himself with New Mexico game laws before coming to New Mexico on hunting expeditions.

MINERAL SPRINGS.

Nature not only blessed Eddy County with a salubrious climate, but also gave it healing springs which will some day be as far famed as those of Carlsbad, Austria, which gave the county seat of Eddy its name. The main springs burst from the banks of the Pecos River, one on each side, 2 miles above Carlsbad, and flow 5,500 gallons a minute into the great river. The medicinal properties of the springs are definite and well recognized as of great value, especially in cases of dyspepsia and kidney trouble. In constituents the water closely resembles the famous Friedrichshall Sprudel at Carlsbad, Austria, as is shown by the following analysis of the two waters, the Carlsbad spring in the first column, the figures denoting grains to the gallon:

	Carlsbad.	Friedrichshall Sprudel.
Sulphate of soda, Glauber's salts	44.02	40
Chloride of sodium	50.50	53.10
Sulphate of magnesia, Epsom salts	21.63	34.40
Sulphate of lime	17.40	8.95
Carbonate of lime	14	.09
Silica	1.20	.29
Iron and alumina	1.20	.....
Carbonate of magnesia	2.06	1
Chloride of magnesia	.....	26
Water of crystallization	8.25	2.18
Total solids	155.25	166.01

TOWNS AND SETTLEMENTS.

Sixteen miles south of Carlsbad is the pretty settlement of Malaga, thus named because its soil is especially adapted to the cultivation of the Malaga grape. The Pecos Valley from Carlsbad to Malaga is for the greater part a continuation of fine farms and miles of shaded roads. In this particular part of the valley the Pecos Irrigation Company has accomplished its most striking results.

Other settlements, all having post-office facilities, are Artesia, formerly Stegman, having a new town site and surroundings that are rapidly settling up on account of the discovery of artesian water, the first well bored flowing 1,200 gallons per minute. A newspaper, the Artesia Advocate, is published here. McMillan and Florence, in the Pecos Valley; Hope and Penasco; Monument on the Staked Plain,

and Westwater toward the Guadalupe Mountains. Otis, Miller, Penasco, Francis, Red Bluff, Lookout, Dayton, and Seven Rivers, are names for agricultural settlements of thrifty farms and orchards.

The Pecos Valley offers beautiful, restful, and healthful homes to the well to do; it offers many chances for good investment to the capitalist; it is a haven of refuge to the health seeker, and for the worker with a few dollars capital and possessed with the energy and thrift to succeed it offers opportunities to acquire an attractive home and a competency.

FINANCIAL STATEMENT OF EDDY COUNTY.

Total indebtedness of said county up to and including June 30, 1902, $65,000, composed of the following items:

Cash balance, January 1, 1903		$30,460.88
Receipts, January 1, 1903, to July 1, 1903, tax collections	$35,498.85	
Receipts, January 1, 1903, to July 1, 1903, other sources		
		35,498.85
Total to be accounted for		65,959.73
Remittances to Territorial treasurer	10,865.96	
Disbursements for all county purposes	18,182.45	
		29,048.41
Cash balance, July 1, 1903		36,911.32

Bonded debt.

Date of issue.	Date of maturity.	For what purpose issued.	Rate of interest.	Amount.
			Per cent.	
Nov. 30, 1891	Feb. 6, 1921	County current expense	6	$7,000
July 1, 1891	July 1, 1911	Court-house and jail	6	18,000
Jan. 1, 1892	Jan. 1, 1912	Lincoln County indebtedness	6	10,000
June 2, 1894	June 2, 1924	Bridge bonds	6	3,000
Aug. 2, 1897	Aug. 2, 1917	Bateman Act, refunding bonds	6	27,000
Total indebtedness of county June 30, 1902				65,000

Public improvements.

Court-house:	
Value of land and buildings	$30,000
Value of furniture and fixtures	1,000
Schools:	
Value of land and buildings	20,000
Value of furniture and fixtures	2,000
Bridges	3,000
Total value	56,000

Valuation and taxation.

Total assessed value of real and personal property for the year 1903, $1,937,914.

Tax rate for county purposes, 4.81 rate per $100.

GRANT COUNTY.

Area, 7,423 square miles. Population, census of 1900, 12,883; census of 1890, 9,657. Since 1900 Grant County has given a large area toward the formation of Luna County. Its present population is estimated to be 12,500. Assessed valuation, $2,912,977. County seat, Silver City.

Officials.—Commissioners, W. D. Murray, J. C. Cureton, O. R. Smythe; probate judge, L. H. Rowlee; probate clerk, W. B. Walton; sheriff, James K. Blair; assessor, E. J. Swartz; treasurer, J. W. Fleming; superintendent of schools, Alvan N. White; surveyor, George R. Brown.

Newspapers.—Silver City Independent and Silver City Enterprise, Silver City; Western Liberal, Lordsburg.

Post-offices.—Silver City, Lordsburg, Alhambra, Cliff, Pinos Altos, Rodeo, Dwyer, Faywood, Sherman, Swarts, Georgetown, Mimbres, Santa Rita, Teel, Fierro, Hanover, Bayard, Central, Fort Bayard, Separ, Steins Pass, Steeplerock, Hanover, Hachita, Whitewater, Goldhill, Redrock.

Grant County, which occupies the southwestern corner of New Mexico, is one of the most rapidly growing and richest counties of the Territory. It is bounded on the north by Socorro County, on the east by Sierra and Luna counties and the Republic of Mexico, on the south by Luna County and the Republic of Mexico, and on the west by the Territory of Arizona. Its area is 4,737,594 acres, about two-thirds of its original area, part of the county being taken in 1884 toward creating Sierra County, and part again in 1901 to create Luna County. Its area at present is about that of New Jersey. Of that area, less than 600,000 acres have been appropriated, while almost 4,000,000 acres are still subject to entry under the United States land laws. During the fiscal year ending June 30, 1903, 18,031 acres were entered in Grant County under the Federal land laws, 15,150 acres of which under the homestead act. The northwestern part of the county forms part of the Gila Forest Reserve.

According to the census of 1900 the population of the county was 10,246, it being the ninth county in point of population, although the fourth in area among the twenty-four counties in New Mexico. Its population then was a little more 1.3 to the square mile. Its present population is about 12,500.

Grant County is preeminently a mining county, although it also leads most of the other counties in the cattle industry. Agriculture, sheep and goat raising, and railroading form the other industries which give employment to the people of Grant County. It is this diversity of industries which makes Grant County one of the richest and its people the most prosperous in the Territory. The assessment returns show taxable wealth of $2,912,977 in the county, which exceeds the per capita taxable returns of most other counties in the Territory.

The census returns credit Grant County with 33 manufacturing establishments, with $248,631 capital invested and employing 221 persons, who earn annually $150,000 in wages and the value of whose products is $944,576.

RIVERS AND STREAMS.

The principal river in Grant County is the Gila, which enters from Socorro County and cuts across the northwestern part of the county, flowing into the Colorado in Arizona, being one of the largest rivers of that Territory. Its principal tributaries in Grant County are the Sapello, the Black River, the Mogollon, Bear Creek, and Duck Creek. Next in importance to the Gila River is the Mimbres, whose headwaters are in eastern Grant County, with its tributaries in Grant County of the Gavilon and Chicken Creek. The headwaters of some of the tributaries of the San Francisco River are also in Grant County, and there are a number of independent water courses, such as the Animas, the Cloverdale, Walnut Creek, Deer Creek, Hanover Creek, Copper Creek, and many others. The waters of the Gila and the San Francisco alone reach the ocean, while outside of the Mimbres all the other streams are dry water courses during part of the year, although after heavy rains they become raging torrents which carry immense volumes of water.

MOUNTAINS.

Grant County is one of the most mountainous in the Territory. While but few of its peaks are very high compared with the altitude of the peaks in some of the other counties, yet they are imposing and the mountain masses are grand. The principal ranges are the Diablo or Devils Range, the Black Range, the Mimbres Range, the Mogollon Range, the Burro Mountains, the Pyramid Mountains, the Peloncillo Mountains, the Hachita Range, the Big Hatchet Mountains, and the Animas Range. The mountains are mostly of volcanic origin and are treasure-houses of great mineral wealth.

AGRICULTURE AND HORTICULTURE.

In the county are probably 150,000 acres that can be reclaimed and irrigated by water in sight. On the meadow lands and plateaus along the Gila, on the Sapello, Copper, Duck, and Mogollon creeks there are about 5,000 acres under cultivation, one-fifth of it by the Gila Farm Company, which, besides raising all of everything needed for home consumption, produces many varieties of fruits of the finest grade. The region is noted for its corn and potatoes. There is a small apiary on this farm.

With a dam properly constructed and storage reservoirs the area of tillable land along the Gila could be increased to 50,000 acres. The principal agricultural section of Grant and Luna counties at present is on the Mimbres River. Almost 20,000 acres on the stream in those two counties is under cultivation, and this area is to be greatly increased in the near future.

There are many thrifty orchards along the Mimbres producing fruit of superior quality, the peaches and apples competing successfully with those raised in the States, many carloads of apples having been shipped in the past to the East and to Arizona. Fruit grown in the foothills of the Mimbres Mountains may have equals elsewhere, but

superior it would be difficult to encounter. The total area of lands under cultivation in the county is, according to the assessment returns, about 10,000 acres, with improvements thereon valued at $130,000.

The waters of the Rio Mimbres disappear entirely in Luna County about 50 miles north of the Mexican boundary line, and the underground current is tapped by wells 25 to 50 feet in depth. The soil is rich and the water for cultivating it can be obtained, while the profits that can be realized will be found much greater than those of California or the East. Danger of droughts renders farming uncertain in the latter regions, while in the former the rains are so distributed throughout the year as to make entire dependence on irrigation necessary. In Grant County the rainy season of July, August, and September leaves only about three months of the year when irrigation must be resorted to, though during the season as many as four crops of alfalfa may be grown on the same ground.

LIVE-STOCK INDUSTRY.

In its live-stock interest Grant County ranks among the first in the Territory, especially in cattle and horses, although sheep husbandry is by no means overlooked, there being over 50,000 head of the "fleecy fellows" grazing upon its hills. While the agricultural lands and improvements are assessed at less than $170,000, its live-stock assessment is almost $900,000, cattle being assessed at only $11 per head, which is considerably less than the range value. In the neighborhood of $800,000 worth of cattle are now annually shipped from Grant County. The raising of hogs and goats is also carried on quite profitably. A few farmers along the middle Gila who raise corn extensively, and who have no immediate market for their crops, put it into pork, which readily brings 5 to 6 cents a pound in Silver City.

There are few extensive horse farms in the county, but they are mostly conducted in connection with the cattle ranches, as riding ponies are a prime necessity to the cow man and are constantly in demand to replace worn-out and aged stock. Silver City and Lordsburg are important shipping points for live stock, and excellent facilities for the purpose have been wisely provided.

MINING INDUSTRY.

The mountains, which occupy fully one-fourth of the area of the county, are literally ribbed with all of the minerals and metals most useful to mankind. Gold and silver have been produced from the mines for a quarter of a century past, while Grant County is proud of the distinction of having the oldest copper mine in the United States—the Santa Rita del Cobre—which was worked by the Spaniards more than a century ago. Enormous veins of the richest and purest iron occurs at several places, hundreds of tons of the ore being shipped daily to the iron and steel works at Pueblo, Colo., and to the smelters at other points.

It has only been recently that capital has sought investment here and made mines out of what heretofore have been prospects. The variety of minerals is great. At present gold and copper are the chief products, but silver, iron, lead, and zinc in their various forms and combinations are found in abundance.

Pinos Altos, 9 miles north of Silver City, is the leading gold camp. The principal operation at the present time is being conducted by the Shamrock Gold and Silver Mining Company, which recently purchased the famous Silver Cell group of mines from the Dimmick Brothers. These mines have been remarkable for many years past for the high-grade silver ore which they produced, but until their purchase were only worked in a small way by the owners, who, as necessity demanded, would take out a shipment which never failed to net handsomely. Some of the ore gave returns of 5,000 ounces to the ton. The ore also carries gold and copper in paying quantities. The Shamrock company is developing the property on an extensive scale, among the improvements being a 60-ton smelting plant, which not only handles the product of the mines, but custom ore as well, and is a great advantage to other properties in the district. The same company is also operating the Pacific mine, owned by the Hearst estate, under lease, taking therefrom fluxing ores for smelter use. Another well-known property is the Mountain Key mine, of which Weld C. Chandler is the owner. This is one of the oldest and best developed properties in the district, but it has never shown up to better advantage than it does right now. The ore is a sulphide carrying gold, silver, and copper and running high in the first-named metal. The Mammoth mill treats the output of the Mountain Key. There are many other good mines upon which much development is now being done with the most satisfactory results. One of these is the Arizona mine, owned by St. Louis capitalists. The ore, which is pyritic, runs well in gold, silver, and copper, and the property has been a big producer for years.

The Hearst estate of California has large holdings in the Pinos Altos camp, having purchased the Bell & Stephens mines and extensively developed them. A concentrating mill, with a capacity of 100 tons per day, is among the improvements. C. Amory Stevens, the New York capitalist, has recently bought the Huston & Thomas properties in this district, and inaugurated active development work. There are a large number of smaller operations constantly going on, and the camp is one of the busiest and most prosperous in the county. Placer mining is also carried on in the gulches draining the high mountains, and the quantity of gold nuggets found every year is a considerable item.

Nine miles from Pinos Altos in an easterly, and an equal distance from Silver City in a northeasterly, direction is the camp of Central. While there are many partially developed properties in this immediate district, the largest operation is the Texas mine, owned by the Fort Bayard Smelting and Refining Company. The mill on this mine has a capacity of 75 tons per day. The ore is a concentrating proposition, carrying much gold, and the values have invariably increased with depth. Much money has been spent in putting this property into shape, and the equipment is exceptionally complete. Some very rich gold finds have been made in this vicinity recently, and several prospects on which work has been abandoned for years have again started up. The camp of Central is only half a mile distant from the Government military sanitarium at Fort Bayard.

Six miles to the eastward is the camp of Santa Rita, in which are located the greatest bodies of copper ore in New Mexico, at least so far as known. The formation is lime, and the ore is oxide, glance, sulphide, carbonate, and native. These mines have been worked for hundreds

of years, the earliest knowledge of copper in the Southwest coming from natives who discovered these mines in the latter part of the last century. The native copper was found by them cropping out of the ground. Masses, a ton in weight, were extracted and shipped to the City of Mexico to be coined into copper money. The miners were driven out by the Apaches in 1838, and work was not resumed until 1873, and then under American management. Work was continued until the early eighties, when copper dropped to 8 cents, when the mines were closed down and lay dormant until the advance in copper a few years ago. When the advance occurred, the Hearst estate management secured an option on these mines from their owner, Joel P. Whitney, of Boston, Mass.

A few months later the option was disposed of to the Amalgamated Copper Company for $1,400,000 cash, making a clean profit of $200,000. The new owners operating under the name of the Santa Rita Mining Company, B. B. Thayer, superintendent, at once inaugurated extensive development works with the result that the property is now the best developed in Grant County, if not in the Territory.

The territory owned by the mining company comprises an area of about 1 mile square, the center portion of which is reserved for development, while the remainder is thrown open to leasers. The ore occurs in a stockwork of veins in a very soft, decomposed porphyry rock, the veins varying in width from knife-blade seams of native copper to bodies of low-grade oxidized ore of 6 to 8 feet in width. A highly successful leaching process has been adopted, by which ore carrying as low as 1½ per cent copper can be concentrated into a product of 86 per cent copper. There are hundreds of thousands of tons of low-grade ore lying on the various old dumps, left about the property by leasers and former owners.

There is also a large concentrator, and plans have been adopted for large smelting and concentrating plants when the property has reached a sufficient state of development. The camp is equipped with a complete system of waterworks, an abundant supply having been obtained in sinking one of the shafts. This supply continues and furnishes a material almost as valuable as copper ore in the region. The output by the Santa Rita Mining Company is quite large, most of the ore extracted being of concentrating grade, and the mill is being run night and day to full capacity, crushing in the neighborhood of 150 tons per day. It is expected that the entire output of this year will far exceed that of last, which was in excess of 6,500,000 pounds of refined copper. The company has established the rule of throwing open good ground to leasers upon favorable terms, and the output from this source is quite large. Some of the regular leasing shippers are Edwards & Co., Crawford & Co., McGregor & Co., Barrios & Co., Skinner & Co., Ernest & Co., Barela & Co., and Fortino Madrid. There are also a number of others who are shipping limited amounts, as well as a number who are working on good prospects. Miners receive $3.50 per day in the Santa Rita camp.

Another important property in this camp is the Wild Cat group, owned by Charles L. Ashton and William Roach, consisting of eight claims. This company has developed vast bodies of sulphide ores, which are treated at a 100-ton concentrating plant which has recently been completed.

The oldest mines in the district, with the single exception of the Santa Rita Mining Company's properties, are the San Jose and Ivanhoe, both of which have been worked almost continuously since the early eighties, producing copper, lead, and silver ores in large quantities. Both properties are being actively operated to-day with the most satisfactory results.

There are many other good properties in the Santa Rita camp on which work is being done with the most satisfactory results. There are over 1,000 men employed in and about the mines.

The camps of Hanover and Fierro lie to the east of Santa Rita. The principal operation in the Fierro camp is by the Colorado Fuel and Iron Company, which employs a large force extracting iron ore from Union Hill for shipment to Pueblo, Colo. The shipments of iron ore during the past fiscal year from these properties amounted to 138,152 tons of 2,240 pounds each. Twenty-five cars, averaging 22 tons each, are about the daily shipment.

Another big mine is the old Hanover copper mine, a patented claim of 20 acres. In 1897, N. S. Berry, agent for F. E. Simpson, of Boston, Mass., obtained from the then owner a one year's working lease of the mine, eight months of which time was occupied in securing and setting up boiler, pumps, hoists, and other machinery and properties necessary to work the mine and develop the same. During the last four months of the lease, from January to May, 1898, there was taken out of the mine and smelter about 6,000 tons of copper ore, running from 12 to 28 per cent. The owner refused to extend Mr. Berry's lease at any price. All the low-grade ore was left in the mine, and its principal value is in metallic copper, running about 7 per cent, and is unusually favorable for concentrating. It is estimated that from 15,000 to 20,000 tons of this low-grade ore is now blocked out in the mine or on the dumps, in addition to a large quantity of high-grade ore. Since October, 1899, all ore has been left in the mine, after being blocked out and on the dumps. The old Hanover is now owned by the Phelps-Dodge people, together with a group of half a dozen or more other copper mines of good prospective value adjoining the central property. The same company has other holdings in this section, one of the principal properties being the Modoc group. The ore on this property, which is being found in large quantities, is heavy sulphide, is self-fluxing, and is greatly in demand at the smelters. It is an exact facsimile of the ores produced at the Bisbee and Gleason camps, in Arizona. The Phelps-Dodge people have recently purchased a number of properties and are doing extensive development work on all of them. The Mineral Point Zinc Company also makes heavy shipments of zinc ore to the works of the company at Mineral Point, Wis. Some of the largest producers in this district are the Republic, which is being worked under lease by J. B. Gilchrist; the Humboldt, owned by Joseph Schlosser; the Anson S., leased to A. E. Dawson; Hugo, leased to Edward Baker; Iron Head, Emma, Continental, and many others. This district is the leading shipper of mineral products in the Southwest.

New operations are also being opened up in Shingle Canyon, northwest of Fierro camp. The product is largely zinc.

The camps of Santa Rita, Hanover, and Fierro are connected by rail with the Santa Fe by a branch to Whitewater Junction.

A camp which is attracting much attention at the present time is the Burro Mountain district, about 14 miles southwest of Silver City. The camp first came into prominence through its turquoise mines, but has now become a large copper producer as well. The turquoise mines were discovered about ten years ago, and have since produced their millions; the largest part of the world's supply now comes from here. This product can be absolutely guaranteed against change of color, which is not true of the oriental gems. The turquoise in the Burros is found in a brecciated porphyry in which fragments of feldspar occur. In this formation the precise conditions seem to obtain which are required to produce the perfect gem, giving the proper proportions of coloring matter, the greatest degree of hardness, and that fineness of texture which gives the material such delicate, velvety smoothness. There are abundant evidences to prove that before its discovery here by white men the deposits had been known and worked quite extensively by the Indians. In fact, its discovery grew out of evidences left by the earlier inhabitants. Beads and pendants are frequently found in the Indian graves and the ruins of their habitations, and it is claimed by some authorities that it was used by them as a currency or medium of exchange. The extensive excavations made by these aboriginal gem diggers pointed out to the more recent discoverers where the deposits existed, and in opening the old workings some hammers and ancient pottery in considerable quantity were taken out. The principal turquoise operators in the Burros are the Azure Mining Company, the Gem Turquoise and Copper Company, and M. W. & W. C. Porterfield.

One of the earliest white men in the Burro Mountain turquoise district was John Coleman, who located several claims in the later seventies and the early eighties. Nicholas C. Rascom was also among the pioneers. These men were followed by many other miners, most of whom were local prospectors. Many of the prospectors had not the means for developing their claims, and for some years little work was accomplished beyond the annual assessments. Most of the stones found at this time were sold for comparatively small sums in the local market at Silver City and elsewhere. In 1882 Mr. Coleman disposed of most of his ground to Messrs. Parker and Porterfield. These men afterwards formed a company known as the Occidental and Oriental Turquoise Mining Company, composed largely of local shareholders. A good deal of development was done by this company, and with some success. In 1901 all the holdings of the Occidental and Oriental Company were transferred to the Gem Turquoise and Copper Company. At this time the popular craze for matrix turquoise was just beginning to spread, and the new company made large sums from the mining and handling of this product.

The popularity of turquoise matrix has since waned, but the new company has worked continuously for over a year, and is making weekly shipments of fine gem material to its New York agents. In 1891 N. C. Rascom sold out his holdings to the Azure Mining Company, a close corporation of three shareholders. Since that time this company has worked continuously, and in the eleven years of operation is said to have averaged fifteen men employed and to have never lost a shift. During most of these eleven years regular shipments of the rough stones have been made to New York. The two companies just men-

tioned are the principal operators in the district. Other claims are held by J. Bush, representing the Silver City Turquoise Company, M. W. Porterfield, the Alessandro Copper Mining Company, and others. On these claims little work has been done of late, and no gem material has been produced. Turquoise mining has been active during the last year. There are at least six companies engaged in working for American turquoises, and it is a question that only time can decide how much increase of output the market will stand. Thus far, however, as the multiplication of companies shows, there is no sign of oversupply; the gem is in high favor, and novel and varied forms of cutting and setting it have been lately introduced. Turquoise has now been found in at least five States and Territories—Arizona, New Mexico, California, Nevada, and Colorado. During the southwestern tour of President McKinley four beautiful turquoises from the Porterfield mines, in the Burro Mountains, were presented to him by Governor Otero. The largest stone was a superb specimen of 20 carats weight. Turquoise is occasionally liable to fade. Some of the companies claim that their stones never change or lose color; if so, indeed, it is a remarkable fact in the case of a mineral so long regarded as unstable in this respect. Several of the companies give a guaranty that if one of their stones changes color within six months after its purchase from a retail jeweler they will replace it with a new one. This is a great improvement on the old method of the Persian dealers, who were wont to decamp for parts unknown as soon as their turquoises were sold. In order to protect themselves against false claims, the several companies have adopted the system of marking each of their stones by cutting a trade-mark on the back, an A for the American Turquoise Company, a circle for the Azure Company, a cross for the American Turquoise and Copper Company, a T for the Toltec, an arrow for the Himalaya, etc.

With regard to the geology of the Burro Mountain turquoise field, the country rock is a granite, and this is undoubtedly the case in the best producing area. Partial metasomatic action is shown throughout the whole formation and toward the south and the southeast the feldspars have been extensively kaolinized. This granite appears to be of later origin than that of the Burro Mountain copper-bearing formation into which it apparently intrudes. Turquoise is essentially a hydrated phosphate of alumina, but it is rarely found in the pure state. It is, in fact, to impurities that its commercial value as a gem stone is due. The beautiful azure color of the best stones is caused by the presence of small quantities of copper. In the Burro district turquoise occurs chiefly in small seams or veinlets or as nodules in the country rock. In most cases the nodules give the best color, hardness, and purity, and are the most valued as gem material. From an economical standpoint the conditions for cheap mining are exceptionally good. Labor, fuel, and water in sufficient quantity are all cheaply and easily obtained, and the fact that most of the mining is done by open cuts and channeling, and that the output of the mines costs practically nothing for shipment, or for treatment after sorting, until it reaches the lapidaries at New York, makes turquoise digging one of the simplest kinds of mining. At present the gem material brings from $5 to $10 per carat at retail, a large and exceptional stone of, say, 20 carats being valued at a higher rate. Most of the claims in this district have been long since taken up and worked, and there

is to-day little chance for the investor to purchase turquoise ground unless it be on the outlying edges of the district.

It has only been within the last few years that the Burros have come to the front as a copper district. The most extensively developed mines in the camp are owned by the Southwestern Copper Company, a Boston corporation. The property consists of 12 claims, the majority of which are patented. The deepest working is only 500 feet, which is on the St. Louis mine. The ore is, as a rule, high-grade copper, but there are great quantities of low-grade concentrating ore. The St. Louis mine has yielded several fortunes since its discovery. The Comanche Mining and Smelting Company, of Milwaukee, is a large property owner, being the holder of 48 good claims. Of these the Klondyke, Comanche, Sulphide Boone, Oquiwka, Milton No. 2, and Canton mines are the most extensively developed. This company is doing a great deal of development work, and from appearances will soon be one of the leading operators in the Southwest. It is now completing arrangements for the construction of a large smelting plant at Silver City, 13 miles distant, to handle the product of the mines as well as custom ore from the several camps in the county. The Sampson group is another well-known property, which has demonstrated itself a paying producer. This group was recently purchased by W. H. Copthorn, of Canton, Ohio, representing Canton and Pittsburg capitalists, who are now developing, and will erect a mill as soon as it has been ascertained what process of treatment is best adapted to the ore. The Alessandro Copper Mining Company, a Connecticut corporation, is also heavily interested, and owns some of the best property in the district. This company has a plant well under construction for the treatment of its ores by the leaching process. Producing mines in the Burro Mountain district are numerous, there being more individual holdings than in any other camp in the county. A few of the principal owners not mentioned above are C. Amory Stevens, the New York capitalist, who has about 50 claims; P. T. McGrath, of Denver; N. C. Rascom; Thompson & Westlake, who are developing the McKinley mine, immediately adjoining the St. Louis; J. H. Bates; E. G. Maroney; Dan Shay; Judge C. Bennett; C. B. Morrill; W. H. Wayland, Jo. E. Sheridan, and others. The general formation of the district is an altered or metaphoric granite, traversed by numerous porphyritic dikes. The ore is carbonates, malachite, azurite, the hydrous silicate, chrysocolla, and the oxide cupride. A peculiarity of the district is that paying mineral is found almost from the grass roots.

One of the busiest mining camps in Grant County at the present time, and one about which comparatively little is heard, is Shakespeare. It is not, as many suppose, a new mining camp, but, on the contrary, was established and became prominent thirty years ago, and was known as Rawlston, named in honor of a prominent and wealthy bank president of San Francisco who spent a fortune in mines in this camp when the output was hauled hundreds of miles by ox teams to smelters. The diamond fraud of the early seventies, the financial failure of several prominent capitalists then interested in the camp, the death of others, and failure of the processes of the time to save values, inaccessibility of the camp, troublesome Indians, and fall in silver proved burdens greater than the camp could stand, and it was not until 1899,

when the rise in copper put prospectors and promoters to hunting up copper mines regardless of ancient history, that Shakespeare again came to the front. In the last few years a number of companies have purchased properties and inaugurated systematic development, until now the camp is a steady producer. Many substantial improvements are being made and more contemplated, and the close of the present year will undoubtedly witness the camp on a permanent basis for all time.

The principal operator in the district is the American Consolidated Copper Company, owning the Atwood and Miser's Chest groups. Of the Miser's Chest group the Miser's Chest and Fort Savage are the best developed. The development on the Miser's Chest is over 1,000 feet, while the Fort Savage has two shafts, tunnels, and drifts. There has been about 1,000 feet of work done on the Atwood group. This company has a concentrating plant of 80 tons capacity, located in Lordsburg, 3 miles distant, and will erect a leaching plant at the mines, with a capacity of 30 tons daily, during the next few months. The ore carries gold, silver, copper, and lead, averaging $28 to the ton. Another large operator is the Aberdeen Copper Company. This company owns about 60 claims in all, but is doing its principal work on the Manhattan mine. The company operates a 40-ton concentrator, which is located on its property. The product of the Aberdeen mines is different from the others in the district in that it is almost exclusively a lead proposition, but of very high grade. The Superior Mining Company is prosecuting active work on the Superior group. The Michigan-New Mexico Copper Company is doing extensive development on the Dacotah Pearl group. A concentrating plant of 100 tons capacity is now being erected by this company. The North American Mining Company owns valuable claims, which are systematically developed with good results. Belt and Linguist have two good claims in their Shoo Fly and Lottie mines, lying immediately east of the Miser's Chest. Chris. Yeager, who, with San Antonio capitalists, owns the Comstock group, is developing the property, and the showing is eminently satisfactory. Col. Samuel L. Bean, a well-known mining operator, has large holdings in this district, numbering about 100 claims in all.

In the extreme southwestern portion of Grant County is the Steins Pass district, which has been a large producer in the past, and which is again coming to the front. The National Gold and Silver Mining Company is doing considerable development work on its properties and is preparing to do more. A new steam hoist and pump have recently been installed and a 50-ton concentrator will be among the improvements added within the next few months. The ore is high-grade silver. Other successful operators are the Wilson Mining and Milling Company, owning the Volcano mine; Judge John May Abbott and associates, William Morris, Robert Williams, and Thomas Fox, who has a low-grade free gold proposition.

There are numerous smaller camps scattered about Grant County, in which paying operations are being conducted. Chloride Flat, 3 miles from Silver City, has produced over $3,000,000 in silver, and even at the present depreciated price of that metal several of the mines are yielding well. Alhambra is another silver camp with working mines. The recent construction of the El Paso and Southwestern

Railroad has resulted in increased activity in the Hachita district, and a short time will place it among the leading camps of the Southwest. At Gold Hill the Reservation, Standard, Nancy Lee and other gold mines are the leading properties. The Carpenter district in the eastern end of the county is assuming prominence as a lead and zinc producer.

The old Carlisle district, in the western part of the county, has not produced very much for the past ten years, but it is probable that this district will be heard from in the near future. The company which now controls the properties of the old Carlisle Mining Company contemplates the resumption of work, and another company is preparing to develop this section by means of deep tunnels. It is not unlikely that this district may in the near future become as great a producer as it has been in the past.

In the western part of the county are large quarries of marble, onyx, and ricolite suitable for building and ornamental purposes.

There is also fine placer ground in different portions of the county, notably about Pinos Altos, but the attention has never been given to this class of mining which the indications and tests warrant. Many arge and valuable nuggets from these deposits are to be seen in collections and cabinets about the county.

MINERAL SPRINGS.

There are a number of mineral springs in the county, some of which have proven to possess remarkable medicinal qualities. The celebrated Hudson Hot Springs, now called Faywood, located about midway between Silver City and Deming, 3 miles from a branch line of the Atchison, Topeka and Santa Fe Railroad, have already achieved a wide reputation as a health and pleasure resort. Here, at an altitude of 5,000 feet, in a region of almost perpetual sunshine, tented over with ever-azure skies, and with a most delightful climate, has been erected, at a cost of $100,000, a large hotel capable of accommodating 125 guests. It stands just to the east and near the base of the great calcareous cone, 40 feet in altitude and half a mile in circumference, which has been the result of the mineral deposits from the spring during all the countless ages of the past. The Faywood is built upon the Mexican plan, inclosing a placita, or court, upon three sides. Surrounding it are 900 feet, or nearly one-fifth of a mile, of cool deep verandas, where one may enjoy the pleasant rays of the sun during the winter months and be sheltered from the winds, no matter from what direction they may blow. Very little wind is experienced, however, as Faywood is located sufficiently near the mountains to be sheltered from their force and yet far enough away to get a delightfully refreshing breeze in summer.

Stretching far away to the south, west, and north is the vast sweep of the grass-covered, sunlit plains, whose rolling swells, as the shifting light and shade plays over them, offer to the beholder a never-ending pleasure and joy; the joy and elation of the open spaces.

On the north, at a distance of 20 miles, is the rugged Black Range; to the east looms the mighty form of Cooks Peak, one of the highest mountains in the southwest, while in the south, clean and sharp against the sky, rises the Florida Range and Red Mountain, with the Three Sisters (Las Tres Hermanas), dim and hazy, 70 miles away, at the edge of Mexico, while to the northwest lie the Little and the Big Burros.

The spring flows directly from the top of the cone, in which a large reservoir, 20 feet in diameter and 40 feet deep, has been excavated. This has been walled and cemented and is covered with a comfortable and graceful open pavilion having a paved floor and comfortable seats around its entire circumference. Here a great stream, at a temperature sufficient to poach an egg or scald a fowl for picking, gushes forth at the rate of 6,000 gallons an hour. This is piped to large cooling tanks, into every room in the hotel, over the entire grounds, and to the well-fitted bath houses at its base.

The curative qualities of the water of these springs have been known for a long time, but it is only in recent years that this has become widely exploited and their availability fully developed. Rheumatism, stomach and kidney troubles, and all blood and skin diseases yield most readily to their persuasive healing powers. For anything in the form of nervous breakdown Faywood is the place of all places. The comfortable home, the peace and quiet, the many and varied forms of exercise, the soothing effects of the baths, and, in fact, the harmony that one in such a condition needs and craves are what will restore his disturbed equilibrium to its natural poise.

A recent analysis of the waters shows that they are quite like those of the world-famous resort at Carlsbad, containing silica, alumina, and oxide of iron, carbonide of iron, carbonate of magnesia, sulphite of soda and potash, and chloride of soda, in such proportions as most effectually to cleanse the system of impurities. They are also palatable to the taste, hot or cold. One of the great benefits resulting to visitors arises from this source. After one becomes used to them it seems impossible to drink too much.

The natural temperature of the water as it wells up in a great stream from far within the framework of the earth is 140° F.

One gallon of water contains the following solids:

	Grams.
Lime (CaO)	5.50
Magnesia (MgO)	1.46
Soda (Na_2O)	11.17
Potash (K_2O)	1.52
Iron and aluminum	.28
Silica (SiO_2)	4.10
Sulphates (SO_3)	4.21
Carbonates (CO_2)	9.98
Chlorides (Cl)	1.77
Lime (CaO)	5.50
Total	39.99
Less oxygen (equal of Cl)	.40
Total solids	39.59

The most obstinate forms of blood and skin diseases, no matter how virulent and deep seated they may be, yield to its curative effects, a course of baths and the continued drinking of the mineral-charged waters entirely eradicating them. In the past few years hundreds of such cases have been cured here.

Under this treatment all complications of stomach troubles are speedily removed.

Kidney trouble of any kind, such as diabetes and other phases of this most harrassing and fatal complaint, are alleviated and permanently removed by the use of these potent waters.

The Gila Hot Springs, 50 miles north of Silver City, are also sought for their medicinal qualities.

THE CLIMATE.

The climate of Grant County, like that of the rest of New Mexico, approaches the ideal, and for the relief and cure of consumption no better climate can be found anywhere. An altitude from 4,000 to 8,000 feet offers the lightness of the air which compels the patient to increase his lung power. Perpetual sunshine; a low degree of humidity; pinon, pine, cedar, and spruce, with their balsam odor; an equable temperature, never oppressive in summer and mild and tonic in winter; cool nights, and a great purity of atmosphere have led even the United States Government to select Grant County as the ideal location for its great military sanitarium for consumptives.

The climate is especially suited to those suffering from catarrh and all throat and pulmonary troubles. The magic chemistry of the atmosphere and the sun soon restore the flagging forces; the blood is reinvigorated and the tissues cleansed and healed. A renewed lease of strength and life are the result.

Probably no country offers a greater amount of sunshine. For 300 days in the year the skies are cloudless, 45 partially cloudy, and 20 are overcast. There is not really a day in the 365 which one may not spend comfortably out of doors. This is one of the greatest advantages of the climate, in that it permits almost uninterrupted life in the open air.

The Government record for this region gives a mean annual temperature of about 55°. The greatest portion of the precipitation occurs in the months of July, August, and September. The evaporation records, as shown in the experiments of W. M. Reid, C. E., engineer for the New Mexico irrigation investigation commission, give an annual evaporation of from 5 to 6 feet, varying of course in conformity to conditions. The highest temperature occurs in the months of July and August, when the records indicate a monthly mean temperature of about 72°. The lowest temperature occurs in December, January, and February, when an average mean monthly temperature of about 39° is recorded.

THE FORT BAYARD SANITARIUM.

The growth in the size of the United States Army during the past few years and in the variety and scope of its functions has brought to the War Department many new responsibilities. One of these has recently been discharged in a rather unique manner by the establishment of a sanitarium at Fort Bayard, 9 miles distant from Silver City, for soldiers affected with consumption.

Quartered at Fort Bayard are several hundred officers and privates suffering from the much dreaded disease, and a decidedly cosmopolitan assemblage it is, embracing men of almost every nationality, soldiers from every branch of the service, veterans young and old, with brain charged with reminiscences of battles and marches and skirmishes in Cuba and China and the Philippines. The United States Government is here carrying on a series of investigations and experiments in the treatment of consumption, which is likely to result ultimately in highly important and beneficial results for mankind at large.

With this end in view some of the brainiest and most experienced physicians in the army service have been detailed at Fort Bayard, and assisting them is a detachment of the most skilled members of the

recently organized corps of army nurses. Already some radical amendments have been made to the generally accepted code of hospital management, and it is claimed that the results attained prove conclusively that the influence of a favorable climate, combined with intelligent observance of certain natural laws and cleanliness, can be depended upon to arrest absolutely the progress of consumption in a majority of cases.

The Fort Bayard sanitarium was opened during the closing months of 1889, and the administrative force now consists of the chief surgeon, 3 assistant surgeons, 10 female nurses, 1 hospital steward, 2 acting stewards, and 20 privates of the Hospital Corps. It is notable that, unlike the authorities in control of many State and municipal institutions for the care of invalids, the War Department at the outset gave the surgeon in charge at Fort Bayard carte blanche in all matters pertaining to the conduct of the sanitarium.

The most scrupulous cleanliness is the keynote of the administration of affairs at the nation's army hospital. It is not only enforced in all departments, but is required of the patients. Kitchens, dining rooms, and dormitories are thoroughly scrubbed each day. To prevent infection and reinfections, no tablecloths or napkins are used in the dining room. The tables are of plain board, and after each meal are thoroughly cleansed with sal soda and boiling water. All tableware is also immersed in boiling water after each using. Each inmate is supplied with towels and bed linen, and no one is permitted to use those allotted to another.

Each patient, upon joining the little colony at Fort Bayard, is subjected to a most comprehensive physical examination. A chart is then prepared showing the stage of the disease at the date of the admission, and subsequent conditions are recorded almost daily, so that the chart shows a complete and continuous history of each case. In addition a weekly record is kept of each patient's weight, and such reports are regarded as an index of the general progress of the individual.

In the Government's scientific treatment of consumption, as exemplified at the station at Fort Bayard, great stress is laid upon the importance of providing an abundance of good, nutritious food. The bill of fare for the patients at breakfast consists of a choice of several cereals, eggs to order, potatoes, broiled beefsteak, ham, chops, breakfast bacon, rolls, toast, wheat bread, butter, coffee, and milk. For dinner there are served roast mutton and beef, vegetables, fresh fruit, bread, butter, and milk. The supper menu comprises cold meat, meat stew, boiled and baked potatoes, stewed fruit, corn and wheat bread, bread and butter, coffee and tea.

The wonderful climate is of course the best tonic or restorative that could possibly be prescribed for a consumptive patient, and to insure their gaining the maximum possible amount of benefit from it the army officers in charge insist upon the patients spending as much time as possible in the open air, and that when indoors they shall see to it that windows are kept open. To such an extent is the enforcement of this regulation carried that inmates of the hospital who are at all able to get out are not permitted to occupy their dormitories between the hours of 8 o'clock in the morning and 7.30 in the evening. Visiting is not permitted, and not only are the ambulant patients required to absent themselves from the dormitories, but it is one of the tenets of

Uncle Sam's innovation in consumption treatment that each sufferer shall remain out in the open air at least eight hours a day.

Each patient is required to make his own bed and keep his personal belongings neatly arranged. All are advised to retire early, to take moderate exercise, unless forbidden by the physician in charge, and to eat slowly. The use of stimulants and cigarettes is forbidden, although smoking and chewing tobacco in moderation are permitted.

During the first year in the history of the new hospital a very satisfactory showing was made, particularly in view of the fact that the new methods of treatment are only at the introductory stage. Several patients were discharged cured and a number of others returned to their homes much improved. The latter consisted principally of sufferers whose cases had reached an advanced stage when they were admitted to the sanitarium, and who, when informed that there was no reasonable hope of entire recovery, preferred to return to their homes and friends. Some of the most severe cases treated have brought out the most interesting disclosures to the medical authorities, who are studying the results at Fort Bayard with intense interest. For instance, there has been a conclusive disapproval of the opinion generally held that hemorrhages are superinduced by residence in a high altitude.

A large solarium is being built at present at the hospital which has over 150 patients, the number to be greatly increased as soon as additional accommodations have been provided.

ATTRACTIONS FOR THE TOURIST.

Grant County offers attractions not only for the health seeker, but also the tourist will find many objects of interest within its borders. Here he will find the typical mining camps which figure in song and story. The mountain scenery is magnificent.

Three miles north of Faywood is the City of Rocks, one of the greatest natural curiosities of the Southwest. Many who have visited both these and the Garden of the Gods in Colorado claim that for interest and grandeur the latter are not to be compared with them. Every time one goes there he finds something new and strange to attract the attention.

In the valley of the Mimbres are a large number of prehistoric ruins, remains of a long-forgotten past. From beneath the floors of these old homesteads and from stone-lined graves outside their walls are exhumed beautifully decorated pottery, beads, bracelets, stone axes, and many other curios which have been buried with the dead, offering a fruitful field to the student of archæology and anthropology. The little valley is now under a high state of cultivation, producing large crops of grain, fruits, melons, and vegetables.

In the mountains there are canyons to explore, minerals to be prospected for, and many unusual varieties of plant life.

The mountains, foothills, plains, and valleys abound in all kinds of game, among which may be mentioned turkey, quail, duck, dove, antelope, deer, bear, and mountain lion. Recently elk have been killed to the south near the Mexico boundary.

Also on the Gila Reservation there are found historic ruins of cliff and cave dwellers. Silver City and the other towns and camps have good hotel facilities and the roads are kept in fine condition for travel.

RAILROADS.

Grant County has 212 miles of standard gauge railroad. A branch of the Atchison, Topeka and Santa Fe Railroad, which enters the county at Hudson Station, connects Silver City with Deming. On this branch a spur from Whitewater Station to Hanover, Fierro, and Santa Rita gives those camps railroad facilities. The Southern Pacific Railroad enters the county at Wilna on its eastern boundary and leaves it a few miles west of Steins Pass on the western border. At Lordsburg the Arizona and New Mexico Railroad branches from the Southern Pacific to the great copper camps of Clifton and Morenci in Arizona, just across the western boundary of Grant County.

The El Paso and Southwestern Railroad, built by Phelps, Dodge & Co., to connect their mines at Bisbee and smelters at Douglas with the various railroads centering at El Paso, enters the county on the east at Victoria, crossing the southern part of the county, and entering Arizona west of Rodeo. It has about 77 miles of trackage in this county. At Hachita it forms a junction with the Lordsburg and Hachita road. The building of this road has opened up the southern part of the county. A great deal of prospecting is now being done in that section, to which the prospector had never before paid any attention, as it was too far from a railroad to ship ore even if it was found. Hachita has become an important shipping point for cattle, which formerly had to be driven to the Southern Pacific road, a saving in drive of some 40 miles.

EDUCATIONAL FACILITIES.

The educational facilities of Grant County are the pride of its people. One of the two normal schools of the Territory is situated at Silver City. The public school building at Silver City is one of the best equipped in the Territory. A principal and six teachers are employed. Lordsburg has just completed a fine modern brick school building, and Hanover, Fierro, and Santa Rita have new school buildings. Every one of the 24 school districts of the county is supplied with a well-equipped schoolhouse. The school population of the county is 3,073.

INDUSTRIAL OPPORTUNITIES.

Like every other county of the Territory, Grant County offers many opportunities for the man with capital to invest. Thus far mines and stock have drawn the largest investments and have proved the most profitable, but there are many openings for small industries which in time would grow to more extensive establishments. The mining camps of the county are good markets for all kinds of products in daily use. Raw material in mineral and ores, in leather, wool, lumber, fruit, and other products offers itself to the capitalists who will build the factories to transform them into manufactured articles. Railroad communication is good and water power can be developed at various places. Direct communication is had with the coal fields of other counties and fuel is not prohibitive in price.

TOWNS AND SETTLEMENTS.

Silver City and Lordsburg are described under the head of "Cities and towns of New Mexico."

Next in population to Silver City is Santa Rita, which, with Pinos Altos, Hanover, Central, and Fierro, is directly tributary to Silver City. Santa Rita has a population of 1,874, Pinos Altos has 1,118 inhabitants, and Central 1,008 people, all three being mining camps. Hanover and Fierro together have a population of about 1,000. The population of the other precincts in the county, according to the census of 1900, is as follows: Upper Gila, 375; San Lorenzo, 329; San Juan, 314; Lower Gila, 306; Mimbres Mill, 295; Raymond, 195; Red Rock, 186; Oak Grove, 172; Pine Cienega, 100; Mangus, 96; Hachita, 93; Georgetown, 88; Separ, 81; Gold Hill, 79; Carlisle, 45; Black Hawk, 31.

The new town of Hachita has been built at the junction of the El Paso and Southwestern and the Lordsburg and Hachita railroads, and is coming into prominence as a railroad center, it being the division point of the roads named.

FINANCIAL STATEMENT OF GRANT COUNTY.

Total indebtedness of said county up to and including June 30, 1903, amounts to $244,271.08, composed of the following accounts:

Bonded debt.

Date of issue.	Date of maturity.	For what purpose issued.	Rate of interest.	Amount.
			Per cent.	
July 1, 1883...	June 30, 1903.	Railroad	6	$57,000.00
July 1, 1885...	June 30, 1905.	Funding indebtedness	7	18,500.00
July 1, 1889...	July 1, 1919...	....do	6	115,500.00
Do	....do	Current expenses	6	27,000.00
Jan. 1, 1902...	Dec. 31, 1932..	Judgments	5	10,000.00
Total bonded debt				228,000.00
Outstanding indebtedness				14,794.93
Judgment indebtedness with interest				5,205.14
Coupon indebtedness				15,938.00
				263,938.07
Less cash in hands of treasurer to be applied to payment of above accounts				19,666.99
Total indebtedness				244,271.08

Total assessed value of real and personal property for year 1903, $2,912,977.

LEONARD WOOD COUNTY.

Area, 3,952 square miles. Population, census of 1900, 5,429. Present population, 10,000. Assessed valuation, $923,017. County seat, Santa Rosa.

Officials.—Commissioners, B. Padilla, J. C. Thomas, R. Harrison; probate judge, F. Garcia; probate clerk, M. B. Baca; sheriff, L. Casaus; assessor, J. B. Giddings; treasurer, L. Sanchez; superintendent of schools, F. L. Braun.

Newspapers.—La Voz Publica and Santa Rosa Sun, Santa Rosa.

Post-offices.—Santa Rosa, Anton Chico, Puerto de Luna, Casaus, Colonias, Conant, Cuervo, Fort Sumner, Guadalupe, Pintada, Salado, Pastura.

Three years ago Guadalupe County, out of which Leonard Wood County was principally formed, was without a railroad, without telegraph, and without telephones. It was practically isolated from the world and even from its neighboring counties. However, a great change has come to that part of the Territory. The Rock Island and El Paso, a part of the great Chicago, Rock Island and Pacific system, has been built across the county, and with it have come a telegraph line, new towns, new settlers, and new life.

Leonard Wood County was organized in 1903 from parts of Guadalupe and Valencia counties. It is really a new country, although Espejo speaks of the wonderful grazing country along the Pecos and the enormous herds of buffalo there congregated, calling the river "Rio de las Vacas," in the same way that Cabeza de Baca had before him described the country and its people. When Onate came in 1595 he found the same cultivation of beans, corn, melons, and pumpkins spoken of by the preceding travelers. Thus, over three hundred and fifty years ago the Pecos Valley was, as to-day, a favorite agricultural and grazing country, the inhabitants in general raising corn, beans, pumpkins, melons, etc., and they possessed flocks of sheep and produced wool which they converted into cloth. The time is not known when the valleys were not the home of prosperous cultivation, the verdant plains not covered with herds of cattle, and the hillsides not dotted by wool-producing flocks.

POPULATION.

The census of 1900 credits Guadalupe County with a population of 5,429, it being twelfth in rank in New Mexico. In 1900 the population by precincts was as follows: Upper Anton Chico, 319; Lower Anton Chico, 528; El Llano, 246; Bado de Juan Paiz, 515; Esteritos, 164; La Junta, 122; Las Colonias, 417; Santa Rosa, 247; East Puerto de Luna, 432; West Puerto de Luna, 665; Salado, 644; Fort Sumner, 200; Endee, 288; Pajarito, 359; La Pintada, 283. Now Leonard Wood County has a population of 10,000 people, actual, bona fide residents.

AREA AND WEALTH.

The area of the county is 2,529,255 acres, or 3,952 square miles, it being fourteenth in size of New Mexico counties. It is almost four times as large as the State of Rhode Island and twice the size of Delaware. Of its area almost 2,000,000 acres are still subject to entry under the Federal land laws. During the fiscal year ending June 30, 1903, there were entered upon in the county under the Federal land laws 9,294.45 acres, 8,974.45 acres as homesteads. The assessed valuation of the county in 1903 was $923,017, the per capita assessment being $171, or about the average of the Territory.

RIVERS.

Leonard Wood County is in greater part in the drainage system of the Pecos River, the northwestern portion being in the drainage system of the Canadian River. The tributaries of the Pecos in the county are the Gallinas, Esteros, Alamogordo, with its tributary, the Petrillo, and the Taiban from the north and the east, while the Pintada, Agua Negra, Little Agua Negra, and Salado flow into the Pecos from the south. The tributaries of the Canadian are the Little Cuervo and Pajarito.

The drainage in this county is rather imperfect, and there are broad areas having no surface drainage. The water sinks into the limestone formation and establishes an underground drainage. The consequence of this is the formation of numerous "dry lakes," which are in reality sink holes, many of these draining large areas. These contain water at certain seasons each year, and it is a constant surprise to the people of the country that they do not leave an alkaline crust upon disappearing, as would result if the water escaped by evaporation. East of the Pecos are the rolling prairies of the Staked Plains, and to the west mountain chains rise out of the broken plain.

On January 30, 1898, the bed of the Pecos at Las Colonias was so dry that a well 15 feet deep barely furnished the water supply for the stock and citizens of that town. A mile or two above Santa Rosa several springs flow into the Pecos and from this point the river channel constantly contains water. The river valley shows signs of powerful erosion, due to the floods of the spring and summer months. North of Puerto de Luna the river has a rapid slope and is kept within its banks in time of flood, but below this point the water becomes muddy. In flood times it overflows the plains extensively, but in low water meanders about among the sand bars in the river bed. Above the Agua Negra Chiquita, near Santa Rosa, the water is practically free from alkali, but this stream and every one south of it add to its alkaline character.

The most important tributaries of the middle Pecos, because of the constant source of supply, are the Agua Negra and Las Tanos, entering just below Santa Rosa. The latter, on the east side of the river, receives an unfailing supply of water from alkaline springs. The smaller rises out of the ground in a canyon about 3 miles from the Pecos and carries, it is estimated, 6 second-feet. The larger spring has its source about a mile and a half from the Pecos, at the base of a low sandstone cliff on the edge of an alkaline marsh. It is remarkable for its size and

depth, the basin of the spring having a diameter of about 70 feet, and a stream of water flows from it carrying about 15 second-feet, receiving additions from numerous small springs on the way through the marsh to the Pecos.

The Agua Negra flows from the Canyon Pintada, a very large arroyo on the west side of the Pecos, draining a large area of mesa country on the east side of the Manzano Mountains. During the summer rains, when great floods of water rush down the canyon, it is reported that little or none reaches the Pecos through the canyon, the greater part sinking into the arroyo bed, at one point it is said actually flowing into the ground through a hole. Several springs appear at various places, but their water soon sinks into the sand.

About 3 miles from the mouth of the canyon a large and constantly flowing spring supplies a stream of water of about 7 second-feet. This may be in part the water which disappears farther up the canyon, but its constancy would seem to indicate some additional and more distant source. It is clear alkaline water, which from its black color has been called Agua Negra by the Spaniards.

These two streams and numerous smaller ones furnish the Pecos with considerable water.

At Puerto de Luna the river in early February is usually 150 to 200 feet wide, and 3 feet deep in places, with an average depth of one-half foot or less, and a velocity of not more than 3 feet per second. Its bed is of changing sand and is fully 200 yards wide between the flood plain banks, showing that floods must fill the river at times when it overflows its banks.

It is a treacherous stream, more difficult to control than even the Rio Grande.

From the mouth of the canyon, a short distance above Anton Chico to La Junta, the junction of the Gallinas, 1,700 acres are under irrigation, while from La Junta to a point about 5 miles below Las Colonias the acreage is 500 acres. By the end of August the water fails at this point, and there is little until the following spring.

About 5 miles below Las Colonias the canyon walls come close together and there is no irrigable land for 15 miles, or until the Las Tanos is reached. Here the valley broadens out again to a width varying from a half mile to 2 miles or more.

Near Santa Rosa there is a large spring from which two ditches are taken, irrigating 100 acres. On the west side of the Pecos there is a ditch taking water from the Agua Negra and irrigating 700 acres.

At this point the entire flow of the Pecos is in use and great scarcity is felt during the irrigation season. Puerto de Luna practically marks the limit of irrigation down the river, there being but little between there and Fort Sumner. There is an occasional small patch irrigated by a spring or private ditch, but not more than 200 acres are cultivated on this portion of the river.

The tributaries of the Canadian River in Leonard Wood County are dry during a great part of the year except where a spring flows from the river bed, but their water is lost in the sand after flowing a short distance.

TOPOGRAPHY.

Leonard Wood County is on the southeastern slope of the Rocky Mountains, whose foothills reach down to the Pecos River. Beyond

that river are the vast Staked Plains. The elevation is from 3,500 feet on the eastern boundary to nearly 7,000 feet on the northwest.

AGRICULTURE.

Leonard Wood County, although it has very fertile soil, is not an agricultural county; yet several thousand acres are under cultivation. The crops of the county are alfalfa, fruit, and cereals. Apples, pears, and peaches here excel in flavor and size, the pears having taken the first prizes wherever and whenever exhibited at Territorial fairs. As yet little effort has been made to develop irrigation enterprises.

The Ellison and Geddings orchards at Santa Rosa long ago demonstrated what can be done in the fruit line. Celso Baca, near Santa Rosa, and Eduardo Martinez, at Anton Chico, have fine ranches, whereon much has been done to prove the productiveness of Leonard Wood County. The soil of the mesas and plains is rich and fertile, producing alfalfa to perfection and all the cereals, vegetables, and fruits of the temperate zone. Land is very cheap, or can be taken up under the Federal land laws, and with such a vast quantity of flood water going to waste down the Pecos annually only storage reservoirs, modern irrigation systems, and intelligent farming are required to make this an ideal farming region.

Around Fort Sumner there is plenty of water to be had by digging from 6 to 60 feet and abundant supplies of water for stock and for irrigation which can be taken from the Pecos River, putting under irrigation 30,000 acres, the Government having this year made a preliminary survey of the proposed reservoir site. The water found is of excellent quality.

STOCK.

One-seventh of the wool grown in New Mexico in 1903 came from Leonard Wood County, the total production being over 3,000,000 pounds. The number of sheep in the county is estimated a little under 600,000. Some of the higher grade wools produced in New Mexico come from this county, the bulk being of Delaine-Merino mixture, and a considerable profit is now being realized by the breeding of high-class Merino and Shropshire bucks for stock purposes.

Cattle raising is an important business; many herds of finely bred Herefords and Durhams are to be found. The number of cattle in this county is estimated at 25,000. Of late years goat raising has received attention, and there are about 10,000 goats here. The raising of horses, including Shetland ponies, is also an important industry, and about 10,000 of these are in the county. The mild climate makes this an ideal stock country.

Almost the whole eastern part is dotted with springs and covered with native gramma grass, which stands dry weather as no other grass does and, although of short growth, is extremely nutritious, possessing the quality of curing and retaining its nutritive properties the year round—in winter as well as in summer. The Pecos River is a favorite ranching section. Ranchmen secure title to a water front and run their herds and flocks on the well-grassed plains and mesa lands extending back from the river for miles.

MINERALS.

While there are no active mining operations in progress, yet there are many promising indications of gold and copper, the latter being found along with the black, ill-smelling oil rock in those curious circular surface depressions which exist in many places. The strata have given way in many cases almost in a perfect circle, and sometimes the depth of the wells is very great. One of these, north of Santa Rosa, known as the Silver Lake, is filled to the surface with undrinkable alkaline water.

Many coal indications exist, and efforts are being made to develop them. In the Salado country and near Santa Rosa capital has been interested in the oil fields, and drilling for oil with every indication of success is in progress. A feature of the Salado oil fields 25 miles south of Santa Rosa is a large mass of silurian limestone, forming veins from 50 to 300 feet wide and impregnated with crude petroleum. Sandstone and shales of the Upper Cretaceous and Tertiary ages abound. Large quantities of petrified mussel shells are found in the sandstone impregnated with petroleum. It is believed that oil will be struck in that section at depths ranging from 1,000 to 1,500 feet. The oil here has a stearin base.

The oil fields 4 to 8 miles north of Santa Rosa have a similar geological formation except that the rock is asphaltum rock and the oil oozes to the surface at various places, especially at the so-called springs on the Perea grant. These oil fields are the same in character as those at Batoum, on the Caspian Sea, in Russia. It is believed that a flow well will be struck at a depth of from 900 to 1,200 feet. The oil indications near Santa Rosa are far better than have ever been found in Pennsylvania. One of the most favorable indications is the 45° trend of the oil lands. Experienced oil men will not go into a new district unless it shows the proper incline. If oil is struck near Santa Rosa, the probabilities are that it will be high grade.

The Consolidated Oil and Fuel Company of New Mexico controls 4,000 acres of oil lands near Santa Rosa which are pronounced to be the most promising undeveloped oil fields in the West. Already nine different companies have been formed in New Mexico and at El Paso, Tex., for the purpose of operating in this region.

Large deposits of good building stone are also found in the county, as well as a limited amount of pine timber of excellent quality.

CLIMATE.

Like the rest of New Mexico, Leonard Wood County possesses an ideal climate for the cure of consumption and other lung and throat diseases. Moderate summers, mild winters, a maximum of sunshine and a rarified and invigorating air class the county as part of the great sanitarium of the Southwest.

RAILROADS.

The Chicago, Rock Island and El Paso Railway, connecting with the Rock Island and El Paso at Santa Rosa, crosses the county from the northern boundary in a southwesterly direction to the western

boundary, the mileage in the county being 98. The mileage of the Rock Island and El Paso from Santa Rosa to the southern boundary of the county is about 60 miles. This railroad has opened the county to settlement and has been the means of bringing in capital, settlers, and new enterprise. It is part of the main line of the great transcontinental system of the Chicago, Rock Island and Pacific Railroad.

A railroad from Santa Rosa to Las Vegas is projected, but has assumed no tangible shape as yet. At Llano, not far from Santa Rosa, the New Mexico Eastern Railway will form a junction with the Rock Island. This road is under construction at the present writing.

On the Rock Island is a remarkably long steel bridge over the Pecos at Santa Rosa. The grades on the line are easy, and it makes the best time between Chicago and El Paso of any railroad.

TOWNS AND SETTLEMENTS.

A description of Santa Rosa is given under the head of "Cities and towns of New Mexico."

Puerto de Luna was the former county seat, and has a handsome court-house. It is situated on the Pecos River, and possesses a number of fine orchards and farms, while round about are sheep and cattle ranches. Population, 300.

Anton Chico, Colonias, Cuervo, and Casaos are agricultural and stock settlements on the Pecos River.

Fort Sumner is the center of a good grazing country, and has a number of bearing orchards.

Pastura is a railroad station, has a post-office, and is developing into quite a trade center. Conant, Guadalupe, Pintada, and Salado are settlements with post-offices.

FUTURE PROSPECTS.

Leonard Wood County will always remain a fine stock country. It possesses vast stretches of grazing land that are not likely to be invaded by the farmer, miner, or factory hand. It is one of the few sections in the Southwest not yet overstocked with sheep and cattle; but Leonard Wood County also possesses vast farming possibilities. The soil is very fertile, and the building of storage reservoirs or the development of water from wells by means of windmills, gasoline engines, or other power will ultimately place large tracts under cultivation.

There is great promise for industrial development in the oil indications, coal fields, and the timber in the county, as well as in the production of such raw products as wool and hides. The indications of gold and copper ores also suggest a source of future wealth, as do the quarries of fine sandstone and deposits of excellent clay. The superb climate invites the health seeker, and in every other respect Leonard Wood County gives promise of being some day a well-populated, rich, and exceedingly prosperous part of the great Southwest.

FINANCIAL STATEMENT OF LEONARD WOOD COUNTY.

Total indebtedness of said county up to and including June 1, 1903, without deducting amount of indebtedness to be assumed by the

counties of Quay and Roosevelt, amounts to $38,169.30, composed of the following amounts:

Bonded debt.

Date of issue.	Date of maturity.	For what purpose issued.	Rate.	Amount.
	Years.		*Per cent.*	
Jan. 1, 1893..	20–30	Court-house and jail	6	$25,000.00
Aug. 2, 1897..	10–20	Funding indebtedness	6	2,735.46
Total bonded indebtedness				27,735.46
Approved accounts outstanding—				
1898				1,080.01
1899				698.12
1900				1,224.44
1901				3,049.96
1902				3,308.92
1903 up to June 1				1,072.39
Total indebtedness				38,169.30

Total assessed value of real and personal property for the year 1903, $923,017.

LINCOLN COUNTY.

Area, 4,954 square miles. Population (census of 1900), 4,953. Present population, 10,000. Assessed valuation, $1,275,347. County seat, Lincoln.

Officials.—Commissioners, Scipio Salazar, S. C. Wiener, P. L. Krause; probate judge, F. Gomez; probate clerk, Leslie Ellis; sheriff, R. D. Armstrong; assessor, Robert A. Hurt; treasurer, E. M. Hulbert; superintendent of schools, E. J. Coe; surveyor, A. E. Williams.

Newspapers.—The Capitan News, Capitan.

Post-offices.—White Oaks, Capitan, Analla, Alto, Angus, Bonito, Fort Stanton, Glencoe, Lincoln, Nogal, Parsons, Ruidoso, Arabela, Hondo, Picacho, Ancho, Corona, Torrance, Oscuro, Carizozo, Jicarilla, Richardson, Coalora.

Since 1891 Chaves and Eddy and in part Otero and Leonard Wood counties have been created out of Lincoln County, and yet the county has an area of 4,954 square miles, or 3,170,600 acres, more than four times the area of Rhode Island, more than twice the area of Delaware, and a greater area than Connecticut. Of this area 2,209,711 acres are still subject to entry under the Federal land laws, of which 2,099,041 acres are surveyed and 110,670 acres are unsurveyed. Only 20,000 acres are under cultivation.

Lincoln County is bounded on the north by Valencia and Leonard Wood counties; on the west by Socorro County; on the south by Otero and Chaves counties, and on the east by Chaves County. It is in the Roswell land district, with a Federal land office at Roswell, Chaves County.

During the fiscal year ending June 30, 1903, there were entered upon 34,250 acres of the public land, 15,445 acres of them by homesteaders.

The population of Lincoln County in 1900, according to the census, was 4,953, or less than one inhabitant to the square mile. Since then, however, owing to railroad construction and rapid mineral development, the population has more than doubled, and conservative estimates place the population at 10,000.

The assessed valuation of Lincoln County for the year 1903 was $1,275,347, being a larger per capita wealth than most of the other counties in New Mexico possess.

Lincoln County lies principally in the drainage area of the Pecos River, the principal tributary of which, the Rio Hondo, rises in Lincoln County and has as its tributaries the pretty streams of clear, cold water known as the Bonito, the Ruidoso, the Eagle, and Little Eagle creeks. The headwaters of the Rio Felix and the Rio Salado, flowing into the Pecos, are also in Lincoln County. Nogal Creek and a number of independent water courses on the west side of the White Mountain range, the latter dry during several months in the year, flow in the direction of the Rio Grande. Shallow lakes, dry part of the year,

springs, and deep and shallow wells add to this water supply. Storage reservoirs, to supplement the present primitive irrigation systems, could increase the cultivated area of Lincoln County to 100,000 acres, but until new sources of water supply are discovered the greater part of the county will be given up to stock ranges and mining operations. Many of the streams are stocked with trout, bass, and other fish.

Lincoln County may properly be classed as a mountainous county, although that portion north of the Capitan and east of the Jicarilla and Gallinas ranges is mostly rolling prairie, which is also true of a strip along the western border.

The principal mountain ranges of the county are the Sierra Blanca, rising to an elevation of 12,500 feet, the Capitan, the Gallinas, the Carizo, the Jicarillas, the Tecolotes, and the Tres Cerros mountains, as well as a number of independent mountain knots and peaks. The average elevation of the county is from 4,000 to 7,000 feet.

AGRICULTURE AND HORTICULTURE.

It is the lack of water alone that keeps Lincoln County from being the granary and the orchard of the Southwest. Climate and soil are perfect for the raising of fruit and grain. The orchards on the Bonito, the Ruidoso, and other streams produce the finest fruit in the United States. Lincoln County fruit takes prizes for its size, color, and flavor wherever exhibited. There are good markets for all the fruit and grain that can be produced in the county. Some success has been obtained in cultivating the ground without irrigation, deep plowing, subsoiling, and thorough cultivation having produced south of Nogal crops of from 50 to 70 bushels of corn per acre. Potatoes are grown with success in several parts of the county, especially in the mountain valleys, the average yield being 2½ tons to the acre.

Good crops of oats, wheat, and barley are raised without irrigation on the mesas south of Nogal. Alfalfa is also grown on the Clive Browne ranch to a height of 30 inches without irrigation. Wild hops grow in abundance on the land along the streams in Lincoln County, and if vines and cuttings were procured from the Pacific States and planted in the valley of the Bonito, Ruidoso, and Eagle and Hondo creeks, an immense yield could be had, and hops are a remunerative crop. Wheat yields 30 bushels to the acre, oats 40 bushels, onions 6 tons, and alfalfa 4 to 5 tons per acre; cabbage 30,000 pounds, beans 4,000 pounds, apples and pears 25,000 pounds, and grapes 8,000 pounds to the acre.

Along the streams a considerable acreage is devoted to the raising of corn, oats, wheat, rye, and other grains, as well as almost every variety of vegetables common to this latitude. These products are all consumed in the mining camps of the vicinity, and in addition large quantities of grain, flour, and vegetables are shipped in from other localities to supply the large and growing demand incident to mining enterprises. Farmers can be multiplied in this region without creating any diminution in the high prices at which farm products are sold in the local markets.

While Lincoln County is justly proud of the varied and limitless natural resources in its bounds, it boasts of the excellence of the fruits which supply not only the local markets, but which are shipped elsewhere and command the highest prices. Along the Ruidoso, Eagle

Creek, Bonito, the Hondo, Three Rivers, and in many other localities remote from streams of water are produced apples, peaches, pears, plums, cherries, grapes, strawberries, and many other varieties of fruits which in flavor surpass any other raised in the West and are equal to any in the world. The orchards which have reached the age of bearing are paying well, and some of the older and more carefully and intelligently treated are yielding fortunes to the owners. It is needless to say that these prolific sources of income are rapidly increasing in number and size and with the ever enlarging demand for the character of fruit raised in the mountain canyons of Lincoln County, this must soon become one of the greatest producers of wealth of the county.

STOCK.

There are in Lincoln County 200,000 head of sheep (many of them of improved stock), 10,000 goats (the greater part high-grade Angoras), 85,000 head of cattle (many of them blooded Herefords), 3,000 horses, and 150 mules. The county is a stock country par excellence. Its mountain slopes yield ideal pasture for goats, while the grass-covered mesas and plains invite the herds of cattle and flocks of sheep. The mild winters, the luxurious and nutritious growth of grass, and the contour of the country make it a paradise for stock. There are many extensive and prosperous stock ranches in the county, but there is room for many more if wells are dug or drilled for additional water supply.

COAL MINES.

Lincoln County is rich in coal, as well as in other useful and precious minerals. At Capitan the New Mexico Railway and Coal Company is carrying on coal mining upon a large scale. The output of the mines at this point in the year 1903 was 96,000 tons of coal. The company employs 200 men and is at present working two seams of coal, one 3½ to 6 feet and the other 2½ to 3½ feet thick.

At White Oaks an especially fine quality of coal is mined upon a small scale by the Old Abe Company. The White Oaks coal fields are capable of extensive development, and now that a railroad passes within 6 miles of them will undoubtedly soon produce as large a tonnage as the Capitan fields. At present Lincoln County produces about 20 carloads of coal per day. The coal is mostly bituminous, although narrow veins of anthracite coal also exist. One vein 27 inches in thickness, a mile south of Nogal, was discovered several years ago, but has never been developed.

MINES.

Mining has given to Lincoln County its greatest fame. Its gold mines are world famous. It also produces silver, copper, lead, cobalt, nickel, wolframite, coal, iron, marble, slate, gypsum, salt, sandstone, and other minerals.

Mines are being worked at Nogal, Schelerville, Loma Grande, Krant Gulch, Parsons, Turkey Creek, Eagle Creek, and Ruidoso for gold, silver, lead, and copper, while the principal mining districts are the White Oaks, the Capitan, the Jicarilla, the Nogal, the Bonito, the Gallinas, the Turkey Creek, the Tecolote, and the Schelerville dis-

tricts, in which there are about 125 patented properties. The best-known mine in New Mexico is probably the Old Abe, in the White Oaks district. It is a free-milling gold mine, and the main streak is a sulphide ore which has averaged about $8 per ton. A number of rich strikes have been made in the mine, and it is credited with having produced a million dollars' worth of ore. Its old shaft, 840 feet deep, collapsed in March, 1896. The new shaft is down 1,300 feet and is perfectly dry, the Old Abe mine being one of the deepest dry mines in the world. In the new works there are 3,600 feet of drifting, while in the old works there are about 4,000 feet. The daily output of the Old Abe is 50 tons of ore, which is treated on the ground. About 50 men are given employment. Other good mines in the White Oaks district are the Compromise, Boston Boy, Lady Godiva (which is developed to a depth of 725 feet), Rita, Solitaire, Little Nell, Rip Van Winkle, Comstock, South Homestake (which has produced $1,000,000 in gold and has a mill), Little Mack, Miners' Cabin, North Homestake, and Silver Cliff. There are large iron deposits in the White Oaks district, averaging from 58 to 68 per cent hematite iron, and quarries of excellent marble and building stone, as well as indications of oil.

The placer grounds of the Jicarilla district have been worked for two hundred years. The American Placer Company has acquired 5,000 acres of placer ground and has erected thereon a cantilever placer machine. The Jicarilla Gold Mining Company has acquired about 40 placer claims in this district, on which it has secured a fine well of water. It is erecting machinery to work the ground on a large scale. It has a sawmill in running order which will furnish lumber and other mining facilities to work its claims. The Rico Mining Company has secured about the whole of the gulch of that name, which contains some of the best pay dirt in the camp, and is getting ready to begin operations. The Free Gold Mining and Milling Company and the New York Placer Company are also working in the district. The placer gulches and bars are being worked by a wet process by these companies, as an abundance of water is found at a depth of from 30 to 245 feet. Much gold will be added to the nation's wealth by these companies. In the Jicarilla camp are many lead claims carrying gold in well-paying quantities. The Hawkeye, lately purchased by Chicago parties, shows values as high as $134 per ton. Fifty assays lately made of this ore gave an average of $18 per ton. Many of these claims are already patented and others are under survey, among which might be mentioned the Eureka, Zulu, Argonaut, Standby, Albatross, Prince Albert, Hawkeye, Knickerbocker, and Evening Star mines. Gold, copper, iron, and galena are the minerals of the district.

The Nogal mining district covers 240 square miles, and its elevation is from 5,800 to 11,335 feet. The district is not rough or broken, but the mountains have even surfaces, with very few rocks, slides, or deep alluvial deposits, thus making prospecting easy. Timber, water, and good wagon roads exist. There are iron and sulphur springs in the district. The first mining in Lincoln County was done at Nogal in 1868. The principal mines are the Rockford, Clipper, Cashier, American (with a mill), Helen Rae (with a Huntington mill), Crosscut, Rialto, Klondike, Ibex, Lucky Comer, Golden Rule, Philadelphia, Red Chief, and Vera Cruz. These properties all run well in gold values, and some of them have brought fortunes to their owners.

In the Gallinas district the Hoosier is the principal mine group. Its claims, as well as the Old Hickory, produce 8 to 65 per cent copper ore. The ore also contains about 20 per cent of lead.

The American Consolidated Copper Company, of New York, which owns and operates extensive properties in other counties of the Territory, is among the largest owners of rich copper and lead properties in the Gallinas, all of which are accessible to railroads.

The Anaconda group of seven claims owned by the United Gold and Copper Company, of New York, located in the heart of the camp, is a very promising property on which preparations are being made for extensive development.

At Schelerville and on Turkey Creek the Iowa and New Mexico Mining and Milling Company is working gold and copper claims. The company will erect an extensive plant for the treatment of the ore.

The Bonito district has witnessed the prosecution of mining operations with a vigor and extent heretofore unknown in that region. The sound of the hammer and the blast are now heard from every hillside, and the formerly dormant camp has taken on a new life and all is bustle and animation. The discovery of new and valuable veins of gold-bearing rock is of frequent occurrence, surprising the old timer who has been walking over these rich deposits for years without realizing the extent of the wealth he had within his reach. This district must in the near future become one of the largest and most profitable producers of the precious metals in the county or in the Territory.

The Bonito district adjoins the Nogal district and lies south of Blanco Peak, the highest mountain in Lincoln County. The principal mines are the Hopeful, Renown, Concho, Rice, Mogul, Orphan Boy, Maude, George Washington, Soldier, Christmas, Expectation, Matador, Yours Truly, Old Adams, Chinaman, and Hope. The owners of the Chinaman mine have opened up 30 inches of high-grade silver and lead ore. Other mines are developing good showings of silver and lead ores. Very rich copper ore has been struck near Conant Station, on the El Paso and Northeastern Railway, and several well-paying mines will very likely be opened up, as the ore from some of the claims assays from 8 to 56 per cent copper, with some values in silver. At a point west of Coyote Station, on the El Paso and Northeastern Railway, there are immense deposits of pure, white gypsum, and in quantities large enough to supply several big stucco mills.

In the Jack Mountain range northeast of the Jicarillas the Jack Mountain Mining and Milling Company has developed some good iron and copper mines. The iron runs 68 per cent and the copper from 6 to 14 per cent. The company has sufficient ore to keep a large blast furnace running for years.

In the Capitan district are large iron deposits which are being developed by a Pennsylvania company. Their proximity to the Capitan coal mines seems to destine Lincoln County as a manufacturing center. South and east of Fort Stanton several small deposits of asphaltum have been found, but thus far no development work has been done.

Near White Oaks the Ludlum Oil Company is drilling for oil with a standard rig. The company is composed of Boston and White Oaks people. An abundance of water was encountered at 400 feet, almost coming to the surface. Near the western boundary of Lincoln County,

but partly in Socorro County, at a point between the Mal Pais and the Gran Quivira, an oil find has been recently made. The surface showing is claimed to be the best in New Mexico. In a shallow well dug for stock-watering purposes the rock is so strongly impregnated with oil as to make it almost impossible for a person to stay long in the bottom of the well. The land for miles around has been located and several companies have been organized to drill for oil. The New Mexico Oil and Development Company is drilling east of this field just within the Lincoln County line. It is down 500 feet. Another company, the New York and New Mexico Oil Company, will erect a derrick and begin drilling this fall. The Comrey Oil Company is north of the new field and in Lincoln County. This company is down 300 feet and has ordered a standard rig. It will resume drilling this fall.

RAILROADS.

Up to a few years ago Lincoln County was without railroad communication with the outer world. The first railway company to build into the county was the El Paso and Northeastern Railway Company, which enters the county near Three Rivers and has its terminus at the Capitan coal fields. The El Paso and Rock Island Railway from Carizozo to Santa Rosa was completed in February, 1902. It cuts across the county from south to north, leaving it near Torrance, a junction point with the Santa Fe Central Railway to Santa Fe and a probable extension to Roswell. This railroad building is opening entirely neglected sections to settlement and development. The following is the railroad mileage in the county:

	Miles.
El Paso and Rock Island route:	
Main line	71.91
Main line sidings	3.40
Capitan branch	21
Capitan branch sidings	2
Santa Fe Central, main line	9
Total	107.31

TIMBER.

Splendid timber covers many of the mountain sides of Lincoln County, especially at the headwaters of the tributaries of the Rio Hondo. Pine, spruce, ash, cottonwood, and black walnut are the main woods found in the Capitan and other mountains. Several sawmills are in operation.

MANUFACTURES.

Outside of three or four ore mills and two sawmills, there were no manufacturing industries in Lincoln County at the taking of the census of 1900, excepting one flour mill situated about 12 miles below Lincoln on the Rio Hondo. It uses water power. The census of 1900 credits Lincoln County with only five industrial establishments, with a capital of $12,900 invested, employing 12 men and producing $13,450 manufactured goods annually. But the future seems to destine Lincoln County as the site of great industrial establishments. Fuel, good water, raw material, and railroad facilities, with near-by markets, will certainly be taken advantage of sooner or later. It is especially in the

reduction of its own ores to save the expense of shipping to outside points that Lincoln County will soon take a lead.

A cement plant owned and operated by Bush & Co., manufacturers of plaster and cement, at Ancho, secures its raw material from the large deposits of gypsum around that place. A good market for the manufactured article, which is extensively used in building operations, is found at Alamogordo, Kansas City, and eastern points. The demand is so great that the plant is already being enlarged.

CLIMATE.

Lincoln County possesses a perfect climate. Like the rest of New Mexico, its altitude, its dry aseptic air, its continual sunshine, its cool summers and mild winters make it a haven of refuge for health seekers, especially consumptives.

FORT STANTON SANITARIUM.

The superiority of the climate of Lincoln County has been recognized by the Marine-Hospital Service of the United States, which at Fort Stanton has in operation a hospital for consumptives which has been enlarged to twice its former capacity and has had many improvements added to it lately. Fort Stanton has an elevation of 6,154 feet, and its mean annual temperature is 52.1° and average annual precipitation 19.05 inches. Its mean spring temperature is 52°, its mean summer temperature 68.1°, its mean fall temperature 51.6°, and its mean winter temperature 36.8°, that part of Lincoln County being blessed with the mildest winters and coolest summers of any part of New Mexico between the altitudes of 6,000 and 7,000 feet. The United States Government this year is expending $80,000 in the way of improvements at the sanitarium. Many of the buildings formerly occupied by the officers of the military post are being remodeled into hospital wards and for other necessary accommodations, while a larger kitchen and laundry will be built and an electric-lighting plant installed. A new post-office building will also be erected. Much pains is being taken to beautify the place and surroundings. Fort Stanton is a picturesque little settlement situated about 6 miles from Capitan, the terminus of the Capitan branch of the El Paso and Northeastern Railroad, and lies under the shadows of the White Mountains, which rise to an elevation of 12,500 feet above the level of the sea, while immediately surrounding it are pine-clad hills. There are 38 buildings of various sizes, most of them being of native rubble stone. There is room for 200 patients, besides quarters for officers and attendants. Twenty-four square miles of fertile grazing and agricultural land on Bonito Creek had been set aside as a Government reservation, and there in the valley lies the fort. As soon as the troops left the gardens turned into weed patches, the fences fell, and deer grazed where the troops had drilled, and coyotes and jack rabbits chased over the parade ground; the old barracks where American soldiers had slept and died began to crumble and soon became the haunts of skunks, owls, and bats, which, as tradition holds it, were disturbed only by the nightly walks of ghosts of departed warriors. Thus it lay for a few years unmolested by soldiers' tread or the crack of the target rifle.

The Marine-Hospital Service is under the jurisdiction of the United States Treasury Department. The Marine-Hospital Service originated many years ago from a fund raised by the sailors on merchant ships who contributed small sums out of their monthly wages. Later merchant ships were taxed according to their tonnage, and now the fund is so large that many marine hospitals are maintained out of it throughout the United States, Fort Stanton being exclusively for consumptive sailors.

The fort is supplied with a steam laundry, electric-light works, ice plant, dairy, butcher shop, pasture, and gardens and comes near being a communistic settlement, self-sufficient and supplying nearly all its own wants.

There are over 100 patients at the sanitarium. There are 6 surgeons and 30 attendants. Each patient is examined upon entering the sanitarium, and an accurate daily clinical record is kept of his condition. The more advanced cases are sent to the hospital, and the incipient cases are assigned to the neat rooms in different wards. Those who are able to leave their rooms go to their meals three times a day and are given a milk-and-cracker lunch in the forenoon. The food consists of meat, and plenty of it, eggs, butter, milk, bread, vegetables, and dessert. In the sick wards physicians and nurses are in constant attendance. All the accommodations of the fort, including board, room, laundering, medicine, and attendance, are furnished free to the patients.

Cleanliness is enjoined upon the patients. They must be temperate and regular in their habits. They are compelled to be in the air, to exercise if their condition permits, and to eat as heartily as possible. In fact, upon the observance of these three conditions depends the promise of a cure. Intoxicants are not allowed on the reservation. Every precaution is taken to kill all germs, and patients must use a pocket cuspidor, which is burned every evening. Outdoor games and gymnasium paraphernalia for the inmates are supplied. A good library is also maintained.

Quite a number of cures already stand to the credit of the institution, and some of them are but short of miraculous. Outdoor life in the peerless New Mexico climate, moderate exercise, regularity of habits, and the stuffing process as far as diet is concerned are the factors that produce the cures, or in hopeless cases bring about an amelioration of symptoms and a prolongation of life, although no case can be pronounced hopeless until death has knocked at the door.

SCENERY AND ATTRACTIONS FOR TOURISTS.

Lincoln County is unsurpassed by any other locality in the beauty and grandeur of its scenery and its pure and invigorating atmosphere. Situated as it is from 4,200 to 12,000 feet above sea level, it offers to the invalid who suffers from the rigors of northern latitudes or the depressing influences of southern heat and from humid and impure atmosphere of the lower altitudes a relief he must appreciate and a new lease of life and restoration to health which he can not realize in most other localities. The winters here are never severe, and the summers in the mountains are simply delightful. No place affords superior attractions to the health seeker than Lincoln County.

The mountain scenery of the county is sublime. Its towering and wooded peaks, its sparkling and pure streams, its valleys and canyons, and its superb climate attract even now hundreds of people annually who come to spend a season in camp. There is good hunting and good fishing. A number of mineral springs, especially iron and sulphur, are attracting attention for their curative qualities.

Lincoln is the county seat and is a quaint old settlement near Fort Stanton and only a few miles from Capitan. A nice court-house has been built at Lincoln. The town has a population of 300 and the precinct of 1,065. It is surrounded by a fruit and grain producing and stock-raising country, which creates a considerable trade.

A description of Whiteoaks and Capitan is found under the head of "Cities and towns in New Mexico."

CARRIZOZO.

The junction of the Rock Island and El Paso and the El Paso and Northeastern railways is called Carrizozo, after the extensive stock ranch and range in the immediate vicinity. It is understood that a large area of land has been secured by the company and that this junction will be made a prominent point on the new line of railroad between Chicago and the East and El Paso. It already contains a number of business houses, an excellent depot, a new and creditable hotel, a twelve-stall roundhouse, and a water-treating plant. This station is the shipping point for Whiteoaks, Schelerville camp, as well as several other settlements in the vicinity. The Carrizozo Cattle Company's headquarters are located about 1 mile from Carrizozo station. This company has for many years maintained the lead among the great cattle raisers of New Mexico. The grade of stock on this range has been steadily improved until the character of the cattle seen in the immense herds of the company is fully equal to any in the West.

A considerable trade is carried on at Picacho on the Rio Hondo, on the Ruidoso near Dowlin's mills, at Angus on the Bonito, and at Bonito, in which localities mercantile houses have been established and are all doing a thriving business.

NOGAL.

Nogal is situated at the mouth of Nogal Canyon, 3 miles from Walnut station, on the El Paso and Northeastern Railroad, in the vicinity of some very rich mines already developed to a considerable extent, and surrounded by a wide field for the prospector, where new and promising claims are continually being located and developed. The town is in a charming location at the base of high mountains and in view of the most picturesque and grandly beautiful scenery. The town enjoys a good and growing trade.

Richardson is on the north side of the Capitan Mountains, in the midst of a wide, well-watered stock range. It is the headquarters of El Capitan Land and Cattle Company, one of the largest sheep and cattle raisers in this region, which controls most of the water sources, and consequently the range for many miles from Richardson, where are located the offices, trading establishment, and post-office which accommodate the residents of that part of Lincoln County.

OTHER SETTLEMENTS.

Arabella and Hondo are pretty and prosperous agricultural settlements, and Parsons and Oscuro, on El Paso and Northeastern Railway, and Jicarilla are mining camps. Fort Stanton is the sanitarium of the United States Marine-Hospital Service for consumptives and has a post-office. Jakes; Coyote, elevation, 5,793 feet; Ancho, 6,001 feet, which has a cement plant; Tecolote, 6,531 feet; Gallinas, 6,656 feet; Corona, 6,650 feet; Alta, 6,654 feet, and Torrance, 6,427 feet, are railway stations, the latter at the junction point of the El Paso and Rock Island Railway and the Santa Fe Central Railway. Here a new town, Torrance by name, is being founded, and is already a trading and industrial center. Many settlers are locating homesteads in the vicinity of Corona, and water is found in abundance by drilling for it. The settlers are mostly from Texas, Louisiana, and Alabama, while some are from Kansas and Nebraska.

AN INVITING FIELD.

Lincoln County, being one of the richest sections of New Mexico in natural wealth, possessing besides a perfect climate, and yet but sparsely settled and inadequately developed, is indeed a promising field for investment by the capitalist, the manufacturer, the miner, and the stockman. The cheapness of fuel and timber, the abundance of raw material, such as iron, copper, and other ores, of gypsum and salt, of hides and wool, should result in the rearing of many industrial establishments. The rich mineral wealth of the mountains has been prospected in but a few spots. There is plenty of room for the building of small and large irrigation systems, the drilling of wells, and the development of agriculture and horticulture. For the health seeker, not looking for luxuries, Lincoln County offers an ideal home, its pine and fir clad hills and dry and aseptic air assuring a certain cure to those not too far advanced with disease.

FINANCIAL STATEMENT OF LINCOLN COUNTY.

Cash balance, January 1, 1903		$32,440.03
Receipts, January 1, 1903, to July 1, 1903, tax collections	$19,339.50	
Receipts, January 1, 1903, to July 1, 1903, other sources	2,045.53	
		21,384.53
Total to be accounted for		53,824.56
Remittances to Territorial treasurer	6,650.45	
Disbursements for all county purposes	17,964.69	
		24,615.14
Cash balance, July 1, 1903		29,209.42

Total indebtedness of said county up to and including June 30, 1902, amounts to $43,675, composed of the following amounts:

Date of issue.	Date of maturity.	For what purpose issued.	Rate of interest.	Amount.
	Years.		*Per cent.*	
Oct. 3, 1882	20	Funded indebtedness	8	$1,500
Jan. 1, 1883	20	.....do	8	800
July 1, 1889	15	.....do	6	24,300
July 1, 1894	20-30	Current expenses	6	6,000
Aug. 2, 1897	20-30	Funded indebtedness	6	11,075
Total indebtedness				43,675

Total assessed valuation of real and personal property for the year 1903, $1,275,847.

LUNA COUNTY.

Area, 1,935,360 acres. Population, 4,000 (estimated). Assessed valuation, $1,502,692. County seat, Deming.

Officials.—Commissioners, William M. Taylor, S. S. Birchfield, W. C. Wallis; probate judge, E. H. Matthews; probate clerk, B. Y. McKeyes; sheriff, W. N. Foster; assessor, J. B. Hodgdon; treasurer, W. H. Guiney; superintendent of schools, U. F. Duff.

Newspapers.—The Deming Headlight, the Deming Graphic, Deming.

Post-offices.—Deming, census population 1,341; present population, estimated, 2,200. Cooks, census population of precinct, 504; Columbus, Cybar, Gage, Cambray, Hermanas, Nutt, Jose.

Luna County, which was created by the thirty-fourth legislative assembly, and organized April 1, 1901, is in the extreme southern part of the Territory, bordering upon Mexico, and having between it and the Arizona line on the west a narrow extension of Grant County which also touches the line of Mexico. The county extends 56 miles north and south and 54 miles east and west, and contains 1,935,360 acres, being two and one-half times the size of Rhode Island. During the fiscal year ending June 30, 1903, there were entered under the Federal land laws 2,994 acres; the homestead applications having been 12, covering 1,800 acres; the lieu selections 4, covering 354 acres; the final homestead entries 5, covering 760 acres, and the 1 desert-land entry covering 80 acres. There are 1,671,000 acres of public land in the county subject to entry under the Federal land laws. The Federal land office for the county is at Las Cruces.

The Mimbres River traverses the county from north to south. There is running water in its upper course, but lower down it sinks. Luna County is primarily a cattle and mining country, although it has a fine rich soil, which can be made to produce abundant crops of all sorts, as well as fruits of the finest quality, through the medium of irrigation. The returns of the assessor's office give the amount of agricultural land under irrigation and cultivated or used for stock-feeding purposes as 9,253 acres, although as the county develops there will no doubt be hundreds of thousands of acres added to it.

The last census was taken when Luna County was still a part of Grant, but the census population of the area included in the county was 2,431. It is at present about 4,000, over one-half of which is in Deming, the county seat.

RAILROADS.

Three railroad lines, the Southern Pacific, the El Paso and Southwestern, and the Atchison, Topeka and Santa Fe pass directly through the county, with a junction at Deming.

The railroad mileage in Luna County is as follows: Southern Pacific, 65 miles; Santa Fe, 110 miles; El Paso and Southwestern, 82 miles;

257 miles in all. Thus it will be seen that the railroad facilities are excellent, enabling shippers to send out products cheaply and conveniently.

CLIMATE.

The mean altitude of Luna County is nearly 5,000 feet. Probably no county in New Mexico has a milder climate. The winters are warm and snow is rare, seldom lying on the ground longer than an hour or two after falling. The summers are pleasant and the nights almost always cool, so that one rests well. There is no malaria lurking in its pure atmosphere. It is free from ague, chills, and fever. For those troubled with rheumatism, catarrh, asthma, bronchitis, and throat or lung diseases there can be found no better climate. This is nature's own sanitarium for the consumptive. Many who have come to this county in the earlier stages of the disease have been completely cured. The elevation, the ozonized air, the pure water, and the invigorating breezes are just what they need. The summer temperature is so modified by the light airs from the mountains as not to be in the least degree oppressive. The average minimum temperature is 28 degrees, taken for a period of ten years. There are in the whole year 300 days of sunshine, 20 days actually cloudy, and 45 days partially cloudy. The 45 days recorded as partially cloudy, however, are frequently more pleasant than a totally cloudless day. There are in reality very few days in the year which one can not enjoy out of doors.

All the villages and little settlements have schools, post-offices, and stores. School terms are from six to nine months in length, and the very best teachers are employed at good salaries.

STOCK.

As a cattle country Luna County offers remarkable facilities. Stockmen are never obliged to feed, their herds pasturing the year round in the valleys and mountains. In years past, during a dry time, stock frequently suffered from lack of water; this has been obviated by the digging of wells, the whole country being dotted with windmills, than which there is no cheaper power for raising water. There are many hundreds of these in the county, and there is always an abundance of grass; it is in this sense everything that could be desired. Owing to the mild and equable climate and abundant water and grass, stockmen have found the country an ideal one for breeding. It has been claimed that the actual cost of raising an animal which will sell for $15 will not exceed $2. (This presupposes the possession of original stock and the owning of a fair-sized herd of cattle.)

There are about 100,000 head of cattle in the county—nearly all stock that will average up well.

Poultry thrives if a little attention is given it. A very ready market for chickens, turkeys, and eggs exists all over the Southwest. A number of chicken ranches established in the county should yield their owners handsome returns. For years quantities of poultry and eggs have been shipped into New Mexico on almost every train from the east. These products, with a little enterprise, could be raised at home where they would be not only a considerable source of revenue but prevent the constant sending of money out of the Territory for something it can produce as well at home.

MINING DISTRICTS.

The county contains four mining districts. The first and most important of these is Cooks, 20 miles north of Deming, where are located vast deposits of lead. The ore is almost entirely lead carbonates, carrying about 40 per cent in lead and 10 ounces in silver, and is especially sought after by the smelters on account of its desirability for fluxing. The deepest working is about 250 feet; as depth is attained there are good copper indications, and it is the opinion of the well-informed that, with development, Cooks will yet have a reputation as a copper-producing camp.

The Graphic Mining Company has taken from its properties something like $500,000 in lead and silver. The El Paso Smelting Company's group of mines has yielded $2,000,000 in the past fifteen years. The Teel and Poe Mining Company has shipped between seven and eight hundred cars of ore, averaging $500 a car in value, or between three and four hundred thousand dollars. Aside from the above-mentioned properties, about $200,000 have been taken from the various mines in the district. Among these may be mentioned the Flower Queen, Chance, Leadville, Inez, and Yellow Mule.

The Victoria mining district lies in the western part of the county near the line of the Southern Pacific Railroad. It has produced in the past over $1,500,000 in gold, silver, and lead. The two principal mines here are the Chance and the St. Louis, and it is from these that most of this amount has been realized. From the Chance mine Mr. Michael Burke, of Deming, on a lease took out in less than a year mineral to the amount of $90,000. Wolframite also occurs in this district. This very scarce and valuable product is found in only a few places in the Southwest.

Twenty-five miles south of Deming lies the Tres Hermanos mining district. There are many properties here which have produced well, although they are all but partly undeveloped. It is safe to state that from the Cincinnati alone $100,000 has been taken.

The Yellow Jacket, owned by a Boston syndicate, is doing development work; the Hancock, owned by a Texas company which is instituting deep workings with apparent success; the Contention, the Johnstown, the A. J. Clark group, and the claims of the Golden Cross and the Eagle Company are all good properties. From several of these considerable sums have been taken. The Hancock is a true fissure lode with seven shafts upon it from 60 to 350 feet deep within a length of 445 feet. Most of the mines were originally worked by men with limited capital, who were obliged to follow small bunches of ore in order to pay expenses. Silver and lead are the main products of the camp, although gold also occurs. Much of the ore is of high grade. The district as a whole will probably run from 33⅓ to 62 per cent lead and from 18 to 51 ounces per ton in silver, with from one-fourth to 1 ounce in gold. The line of the Southwestern and El Paso Railway passes very near this camp, which will have a very strong tendency to increase the development of property in the district.

The Florida district is in the Florida Mountains, 12 miles southeast of Deming. But one good mine has been developed in this district, the Silver Cave, from which over $60,000 has been taken, and which the Carroll Brothers are again working with improved machinery. The Florida Sierra mine, which is being worked at present, is develop-

ing into a fine fissure vein of copper to such an extent that its owners are making preparations to establish a concentrator and smelter in connection therewith. J. G. Clark and Hodgdon & Allison have done a great deal of work at the upper end of the range.

Luna County certainly has a bright future as regards mining. But a small fraction of its territory has been prospected. The mines which have been discovered have not always been worked on the most economical basis. The increase of railroad facilities will have a tendency to promote renewed interest in this, the most attractive, and, under favorable circumstances, most remunerative of all industries.

IRRIGATION AND AGRICULTURE.

In the northwestern part of Luna County, along the valley of the Mimbres, are fine farms, which are irrigated from the river. These produce immense crops of alfalfa, wheat, corn, and fruits. In fact, the agricultural products are of almost every variety. Vegetables are produced in great abundance and of the best quality, including potatoes, sweet potatoes, beans, peas, beets, celery, onions, pumpkins, squashes, watermelons, and cantaloupes. Drew Gorman, who raises large crops of the finest watermelons in the land, which he markets at Silver City, Santa Rita, and Hanover, says that no crop he can raise is so valuable. He sells melons by the wagon load at the ranch at the rate of $30 a hundred. Here are also grown peaches, pears, plums, apricots, cherries, and fine apples. The soil in the valley is a deep, rich alluvium and needs only to be irrigated to produce heavily.

A large company is now exploiting an undertaking by which it proposes to build dams across the Mimbres Valley and thereby raise the water to the surface. It has acquired a large body of land and made preliminary surveys. The idea is to put many hundred thousands of acres under ditch and divide them into small holdings.

The vast plain which surrounds Deming consists of thousands of acres of excellent land. Water is the only thing needed to make it productive. Possibly artesian wells may be developed in the future.

One mile east of Deming the Wah Brothers have 20 acres of land under cultivation, planted to fruit trees and vegetables. They have a steam pump, which raises from two to three hundred gallons of water a minute, which is more than sufficient for their needs. They raise excellent vegetables in large quantities, and have proved conclusively that the soil is capable of producing all sorts of farm and garden products.

TOWNS AND SETTLEMENTS.

A description of the flourishing city of Deming, an important railroad center and the county seat, is found under the head of "Cities and towns of New Mexico," in another part of this report.

Cooks is a thriving little mining camp. At Columbus, on the Mexican border, is a custom-house.

To sum up, Luna County has within its borders the untold treasures of the hills; great herds of cattle, which feed and thrive upon the nutritive natural grasses which cover its plains and mountains; an inexhaustible body of water a short distance beneath the surface, which, through the medium of windmills and small engines, can be made available easily and cheaply; a climate unsurpassed in all the world;

a soil that will produce, through irrigation, almost anything in the way of crops; complete railroad facilities; good schools; a law-abiding, thriving, intelligent people, and an economically administered county government.

County finances.

Per certified statement of the county commissioners of Doña Ana County, N. Mex., the county of Luna is indebted to the county of Doña Ana in the sum of	$11,892.50
Per certified statement of the commission to determine the amount due from Luna County to Grant County, as per house substitute for house bill No. 64, the said commission did certify that the amount due from Luna County to Grant County, according to existing conditions, on April 1, 1901, to be	51,654.83
Local approved accounts outstanding to June 30, 1903	3,017.24
Total indebtedness to June 30, 1903	66,564.57

Total assessed value of real and personal property of Luna County for the year 1903, less exemptions, is $1,502,692.

No bonds have been issued by Luna County.

McKINLEY COUNTY.

Area, 5,377 square miles. Population, 6,500. The county was created after the census of 1900. Assessed valuation, $968,107. County seat, Gallup.

Officials.—Commissioners, W. L. Bretherton, W. H. Morris, S. E. Aldrich; probate judge, D. Apodaca; probate clerk, F. W. Meyers; sheriff, W. A. Smith; assessor, S. Canavan; treasurer, J. C. Spears; superintendent of schools, J. H. Coddington; surveyor, William McVicker.

Newspaper.—The McKinley County Republican, Gallup.

Postoffices.—Gallup, Clarkville, Fort Wingate, Gibson, Guam, Manuelito, Ramah, Thoreau, Tohatchi, Zuni.

McKinley County was created out of the western portion of Bernalillo County by the legislative assembly of 1899. The assembly of 1901 added a portion of Valencia County and a strip of San Juan County, making its area 3,441,525 acres, or 5,377 square miles, which is more than five times the area of the State of Rhode Island, almost three times the area of the State of Delaware, and almost 500 square miles larger than the State of Connecticut. Of the area 900,000 acres are subject to entry under the Federal land laws, 1,000,000 acres are reserved, and the remainder has been appropriated. During the fiscal year ending June 30, 1903, there were entered upon 1,276 acres under the Federal land laws, and 1,036 acres under the homestead act. The county has a population of 6,500. The assessed valuation for the year 1903 is $968,107. There are about 5,000 head of cattle and 100,000 sheep in the county. Its main wealth is in its coal mines and large timber tracts. The area of agricultural lands is small, being assessed at only $9,715.

WATER SUPPLY.

The Zuni River rises in the county and with its tributaries furnishes the main water supply for irrigation. The area irrigated on the Zuni is about 1,000 acres and along the tributaries of its headwaters about 1,200 acres. Reservoir sites are found along the streams, and on the Zuni Reservation reservoir sites have been surveyed and the preliminary plans completed for an irrigation system which will reclaim 10,000 acres at a cost of $100,000. Quite a number of springs exist in various parts, and water is found at varying depths.

COAL MINING.

Over a half million tons of coal are produced annually, the county leading all except one of the Territory in the coal industry. The mines are grouped around the county seat of Gallup, situated on the Santa Fe-Pacific Railroad, which cuts through the county from southeast to west for 75 miles and is a part of the great Santa Fe system. A north

and south railroad line has been surveyed, to be known as the Colorado and Gulf Railway, and is to be built from Durango, Colo., to Clifton, Ariz. The Colorado Fuel and Iron Company, the American Fuel Company, the Caledonian Coal Company, and Senator W. A. Clark, of Montana, are the principal coal operators. Other operators are the Union Coal Company, Stephen Canavan, and William Stewart. Nine mines are being worked at present.

The W. A. Clark mine is located at Clarkville, 5 miles west of Gallup. Here a prosperous camp has sprung up, which is being conducted along model lines. The property covers 1,200 acres and is underlain by fine veins of coal, varying from 2½ to 7½ feet in thickness. The depth of the main entry to the mine is 2,750 feet from entry to face. The coal is a lignite and of excellent quality for steam and domestic purposes. The annual output of the mine is 65,000 tons, valued at over $200,000. The coal is marketed in New Mexico, Arizona, and California. About 300 men are given employment. The mine is lighted by electricity and there is electric power for all the machinery. The town of Clarkville has 500 inhabitants. There are 100 dwelling houses, a large schoolhouse, a hall for lodge meeting purposes, a hotel, a two-story brick store, and a reading room, all owned by Senator Clark.

Gibson is another important coal camp, situated 3 miles northwest of Gallup on a spur of the Santa Fe Pacific Railroad. The principal mine is the Gallup, owned by the Colorado Fuel and Iron Company. There are six coal seams of workable thickness on the property, with a cover of 100 feet on the top vein. The seams are all exposed by outcrop. Three veins are being worked at present. The mine is operated by slope, double-entry, room, and pillar system. The coal is lignite, and the annual output is 150,000 tons, valued at $150,000 at the mine. There are 250 men employed here.

The Weaver mine, owned and operated by the Colorado Fuel and Iron Company, is situated at Gibson. This is a new mine, upon which there are six veins of coal, two of which are being worked. The mine is operated by drifts into the veins, and then by double-entry, rib, and room system. A well 1,000 feet deep furnishes an ample supply of water. About 425 men are employed. The mine produces about 450,000 tons of coal a year,

The camp of Gibson is beautifully situated and contains 165 comfortable six-room dwellings and a good schoolhouse, the school being in part supported by the company. It has 1,500 inhabitants.

The Catalpa mine, 3½ miles southeast of Gallup, is also owned and operated by the Colorado Fuel and Iron Company. A railroad spur connects the line with the Santa Fe Pacific Railroad. Two seams of coal, each 6 feet thick, are being worked on this property. The mine produces 100,000 tons of coal per year, valued at $150,000. About 150 men are given employment. Quite a mining camp, with 100 dwellings, several boarding houses, a large store, offices, and storerooms, has grown up around the mine.

The Thatcher coal mine is located 3 miles east of Gallup, and is owned and operated by the Caledonian Coal Company. A spur connects the mine with the Santa Fe Pacific Railroad. Two coal seams have been worked on the property, each being 4½ feet thick. The mine can produce 50,000 tons of coal annually, valued at $75,000. One hundred men are employed when the mine is worked.

The Otero mine adjoins the Thatcher property and is about 2½ miles east of Gallup. It is also owned and operated by the Caledonian Coal Company. A spur connects the mine with the Santa Fe Pacific Railroad. Three of the four veins of workable thickness are being worked by slope, double-entry, room, and pillar system. The output of the mine is 75,000 tons annually, and the number of men employed is 150. The Thatcher mine has been shut down for want of orders since June, 1901, and since that date, for the same reason, the Otero has been producing only about one-third of its full capacity.

The Rocky Cliff mine is 2 miles east of Gallup, and is owned and operated by Stephen Canavan. The coal is lignite, and the vein that is being worked is 4½ feet thick. The output of the mine is 30,000 tons a year, valued at $40,000. The number of men employed is 75.

The Union mine is located 1½ miles south of Gallup, and is owned and operated by the Union Coal Company. There are three seams of workable thickness, at a depth of 35, 320, and 360 feet, respectively. These outcrop in a canyon half a mile from the Union mine. They vary in thickness from 5 feet 4 inches to 6 feet 6 inches. The mine is opened by slope, double-entry, room, and pillar system. The coal is lignite, and the annual output is 10,000 tons, valued at $16,000. About 15 men are employed.

The Stewart mine is 1 mile north of Gallup, and is owned by the Santa Fe Pacific Railroad, but is operated by William Stewart. The coal is lignite of a superior grade, and the vein that is being worked is 6 feet thick. The annual output is 7,500 tons, valued at $12,500. Fifteen men are employed.

The Canavan is a new mine that is being opened 1½ miles north of Gallup. The vein is 6 feet thick at a depth of 132 feet.

TIMBER, MINERAL, AND OIL.

In the southern part of the county is the famous Mitchell tract of timber lands, which is about to be exploited by the American Lumber Company, which is building a standard-gauge road, 20 miles long, into the tract from Thoreau. The Santa Fe Pacific Railroad also owns large timber tracts along its line. In the eastern part of the county are good copper indications, while in the western part the oil indications are so promising that at Manuelito a well is being drilled at the present time. South of Gallup there are salt lakes, which will be of great commercial value if the proposed Colorado and Gulf Railroad is built.

SIGHTS FOR TOURISTS.

A portion of the northern part is covered with lava and there are many signs of volcanic activity. In the northeastern part are famous cliff dwellings and prehistoric ruins, which have excited the wonder of scientists. Excavations that are being made north of Thoreau have brought forth many relics, which are finding their way to eastern museums. The Chaco Canyon and the Pueblo Bonito, which are on the San Juan County boundary line, are visited annually by many tourists. A railroad line from Thoreau to Durango, by way of the Pueblo Bonito, to connect the Santa Fe Pacific and the Denver and Rio Grande railroads, is proposed. Part of the large Navajo Indian Reservation is in the northeastern part. The Navajos are wealthy in sheep

and horses and are good workmen, being given employment in large numbers on the railroad or the sugar-beet fields of Colorado. They are the finest blanket weavers among Indian tribes, and their fame as silversmiths has spread far and wide. Part of the reservation is an excellent range country, especially for sheep, and in other parts are rich mineral indications, especially of copper.

THE ZUNI INDIANS.

In the southern part is the Zuni Indian Reservation, the principal pueblo being Zuni, one of the famed Seven Cities of Cebolla and one of the most interesting of the Indian pueblos. The Government contemplates building extensive irrigation works for these pueblos, who at present have over a thousand acres under irrigation along the Zuni River and its branches. The principal crops are Indian corn, wheat, alfalfa, chili beans, onions, melons, and squashes. Many Indians have small orchards of peach, apricot, apple, cherry, and plum trees and grape vines. The irrigation systems of the Zunis are very crude, but furnish a water supply sufficient to mature the crops in the average season. The majority of the Indians have from 10 to 20 acres each under cultivation, while some have as high as 30 to 40 acres. Their methods of harvesting, thrashing, and grinding grain are very primitive. The Zunis own horses and cattle and occasionally burros, swine, goats, and chickens, but their main wealth is in sheep. The area of the reserve is 427 square miles and the population 1,525. Most of the farms are situated from 15 to 25 miles from the pueblo, in small valleys and canyons. Throughout the growing and harvesting season the Indians spend most of their time on the farms, returning to the pueblo in the fall. The Zunis are also famous blanket makers.

FORT WINGATE.

Fort Wingate is 15 miles southeast of Gallup and a little over 3 miles south of the Santa Fe-Pacific Railroad. It is the only military post in New Mexico at present occupied by troops, and the Government is spending $75,000 making improvements enlarging the fort so as to accommodate six troops of cavalry. The post was established in 1863.

SETTLEMENTS.

Post-offices have been established in McKinley County in addition to Gallup: Clarkville, Gibson, Fort Wingate, and Zuni, at Ramah, where a Mormon agricultural colony is located, and at Thoreau, Dewey, Manuelito, and Tahatchie, the last named being on the Navajo Indian Reservation.

M'KINLEY COUNTY'S FUTURE.

Its immense supply of fuel marks McKinley County for a future industrial center. The raw material for many industries can be supplied by the county or adjoining counties, and with new railroad lines and the building of storage reservoirs the county will become one of the most prosperous and richest of the subdivisions of New Mexico.

MORA COUNTY.

Area, 2,542 square miles. Population, 13,000; the census of 1900 gave it a population of 10,304. Assessed valuation, $1,175,823. County seat, Mora.

Officials.—Commissioners, M. Maestas, F. A. Vigil, M. Lopez; probate judge, G. Rivera; probate clerk, E. H. Biernbaum; sheriff, T. Melendez; assessor, A. Medina; treasurer, R. Roybal; superintendent of schools, R. Romero; surveyor, W. H. Garner.

Newspaper.—El Combate, Wagonmound.

Post-offices.—Mora, Wagonmound, La Cueva, Cleveland, Guadalupita, Chacon, Ocate, Roy, Lucero, Halls Peak, Holman, Weber, Shoemaker, Watrous, Mills, Ledoux.

Mora County's agricultural products exceed those in value of any other New Mexico county, and it can rightfully claim the honor of being the leading agricultural county in the Territory. However, its range interests exceed in value even its agricultural wealth. Yet its area is only 2,542 square miles, being less than that of any other county, excepting Santa Fe, Taos, and Bernalillo; still this area is more than twice that of Rhode Island and 600 square miles greater than that of the State of Delaware. According to the census of 1900, its population is 10,304, or 4 people to the square mile, a density of population exceeded only by Santa Fe, Bernalillo, and Taos counties. The population by precincts, according to the census of 1900, is as follows: Mora, 741; Cleveland, 615; Guadalupita, 292; Cherry Valley, 153; La Cueva, 570; San Jose Cebolla, 372; Golondrinas, 277; Ocate, 1,100; Agua Negra, 555; Coyote Lucero, 236; Tiptonville, 334; Wagonmound, 895; Loma Parda, 158; Armenta, 380; El Llano del Coyote, 351; El Rito de Agua Negra, 699; Ocate Naranjos, 363; Abuela Cebolla, 424; Carmen, 328; Mora Cordillera, 207; Turquillo, 398; El Oro Cebolla, 174; Watrous, 244; Ciruela, 244; Gascon, 194. Since the census new precincts have been established and names and lines changed so that Wagonmound precinct has 1,159 population, taking the census figures; Roy, 200; San Jose El Oro, 546; Ocate Naranjos, 1,463; Golondrinas, 435.

The county is mountainous, the main ridge of the Rocky Mountains passing through its western part, while the foothills extend almost to the eastern boundary. Some of the peaks rise to an altitude of over 13,500 feet, while the lowest point in the county has an altitude of 4,000 feet.

The hills are generally timbered, and a portion of the Pecos River Forest Reserve is in the county. From the main range, broken by the foothills, the mesa extends gently sloping toward the southeast. There are picturesque canyons and fertile valleys, making the topography a very broken one. The county is almost entirely in the drainage basin of the Canadian River, the Mora River, a tributary of the Canadian, with its tributaries, furnishing the principal water supply

for irrigation. Other tributaries of the Canadian in the county are the Ocate, the Vermejo, and the El Perro. The Sweetwater is a tributary of the Ocate. The principal tributaries of the Mora are the Coyote, the Cebolla, the Sapello, the Guadalupita, and the Lobo. The Pecos River rises in the western part of the county, and so does the Santa Cruz, the latter belonging to the drainage basin of the Rio Grande. The tributaries of the Mora drain about 40 miles in length of the eastern slope of the Rocky Mountains and play an important part in the determination of the stream flow. The entire normal flow of the Mora and its tributaries during the irrigation season is consumed in irrigation, there being no surplus water except during the nonirrigation season and during the season of freshets. In fact, there is a chronic scarcity of water, which, in the case of the Coyote, Cebolla, and Sapello, is sometimes felt as early as April. This want of water has been only within the past fifteen years, and is due not to any increase in the acreage cultivated, but to the cutting of timber on the mountains in which these streams rise.

Each year freshets are increasing in frequency and volume, the period of drought becoming longer, and the scarcity of water is more keenly felt in some sections, but the building of storage reservoirs will remedy these conditions. Two ditches have been built, taking water from the Rio del Pueblo or Picuris Creek, in Taos County, and diverting it through passes in the mountains. One ditch is carried nto the Agua Negra River and the other into San Antonio Creek, both being tributaries of the Mora River. At La Cueva three reservoirs have been built; another reservoir is situated near Sapello, and there are many more splendid reservoir sites. The acreage irrigated along the streams in Mora County is as follows: Ocate, 2,000 acres; Coyote, 2,300 acres; Cebolla, 2,200 acres; Manuelitas, 2,000 acres; Sapello, 2,600 acres, and Mora, 5,700 acres.

On the Sapello, about 3 miles above Watrous, a diversion of the flood waters has been made into a series of small lakes to the south of the stream, they being used as reservoirs. The combined capacity of these lakes is sufficient for the irrigation of 500 acres. At Buenavista, where the Mora River enters a narrow canyon, a dam 90 feet in height would form a reservoir covering 1,770 acres and with an impounding capacity of 41,000 acre-feet. At the junction of the Mora with the Manuelitas Creek and the Sapello, a dam 100 feet in height would cover 1,037 acres and give an impounding capacity of 41,000 acre-feet. In Cherry Valley below Watrous is a natural reservoir requiring no dam, which could be filled by a canal from the Mora River. Its area is about 800 acres with an impounding capacity of 15,000 acre-feet. A 60-foot dam in the Mora River near La Cueva would form a reservoir covering 620 acres and having a capacity of 5,400 acre-feet. The flood waters are often of great volume in the Mora, being sometimes as high as 5,000 second-feet. These reservoir projects are very feasible and would bring many more acres under cultivation.

WEALTH.

The assessment of 1903 gives the taxable wealth of Mora County as $1,175,823, an increase of $9,145 over the previous year. The census of 1900 gives the value of agricultural wealth of the county as $2,581,000, but the real wealth of the county undoubtedly approxi-

mates $6,000,000. During the past fiscal year 11,134 acres were settled upon by homesteaders, 939.92 acres were taken up as desert lands, and altogether 13,572 acres were entered upon under the Federal land laws.

Mora is one of the few counties in the Territory where the area appropriated exceeds the area of public lands. The area still subject to entry under the Federal land laws is 760,000 acres, while that appropriated is 830,000 acres. The agricultural lands of Mora County are valued on the assessor's books at $225,000 and the grazing lands at $341,000, but the census of 1900 shows that they are worth at least four times as much.

CLIMATE.

Like the rest of New Mexico, Mora County enjoys a peerless climate that is a specific for lung and throat troubles. Its high altitude, the purity of its atmosphere, the grandeur of its scenery, its pines, spruce, cedar, and pinon forests make it an ideal section for homes and a health-seeker's paradise. The annual rainfall is slight and occurs mostly in the summer months. There are no extremes in temperature either in summer or winter, the winters being mild and sunshiny and the summers cool, and even cold at night in the mountainous sections. There is good fishing and hunting in the country; roads are good and accommodations for tourists and health seekers are plain but substantial and comfortable.

RAILROADS.

Mora County is crossed from north to south by the great Santa Fe Railway. The mileage is little over 40 miles. A railroad from Las Vegas to Mora has been surveyed, and an extension from Mora to Taos is contemplated. Mora County needs more railroads for its development and would give heavy tonnage to such. The building of railroads would also lead to the establishment of many industries, for which the raw materials can be furnished by the county, for which the fuel and water power are there, and home markets could easily be found.

TIMBER.

Many parts, especially in the mountains, are heavily timbered districts. Steps are being taken to protect some of the timber sections, especially on the Pecos Forest Reserve. This does not prohibit the cutting of timber, but merely regulates it. Seven million feet of lumber are annually shipped out of the county. From 25 to 50 wagon loads of ties and telegraph poles are daily taken to the railroad.

MINING.

Mora is not a mining county, but there are indications in plenty of mineral wealth equal to that of any section of the Rocky Mountains. Many prospects have been located and some of them show considerable development. The indications of copper ore are especially promising. Extensive work is being done in the Rociada and Coyote mining districts, as well as in the northern part of the Pecos River Forest Reserve. The Rociada Gold and Copper Company is down 200 feet,

and has a 6 to 8 foot vein of copper, assaying from 10 to 20 per cent, in addition to the gold, silver, and lead. There are many other good prospects in the same vicinity, some having ore running as high as 35 per cent in copper. The Santa Barbara King mine, near Mora, has had assays of from $60 to $70 per ton. There is a small smelter at Rociada. El Oro gravel was formerly worked with the pan, each pan yielding as much as a turkey quill filled with gold dust. In the Coyote mining district several hundred thousand dollars have been expended, but litigation has caused operations to lag. Specimens of ore have been picked up that assayed $3,260 in gold to the ton, and there is a tradition of a "lost mine" that at one time yielded fabulous sums. This mine is supposed to be located on the Mora grant, and much money has been expended to rediscover it. It is natural to suppose that with mountain formation similar to that of the richest mineral districts in the world, and rich float being picked up in every part of the county, as well as mineral veins apparent on the surface in many localities, that Mora County has a great future as a mineral producer. Although Mora has no coal mines, the coal indications are such that many thousands of tons could be produced annually with but little labor and investment of capital. Clay for brick making, red and white sandstone, and limestone exist in large quantities and of commercial quality. Near Wagon Mound deposits of alum are reported.

THE STOCK INDUSTRY.

According to this year's assessment the county has about 15,000 cattle, 76,919 sheep, and 3,000 goats. As a matter of fact these figures should be multiplied at least by 2. The wool produced in the county amounts to about 750,000 pounds annually, and the cattle shipped out annually total almost as many as the assessment credits the county with. It has an ideal range and the raising and fattening of beef cattle is one of the principal industries around Wagon Mound, Watrous, and other settlements. The eastern portion is devoted entirely to stock raising. The mesas support numerous flocks of sheep and herds of cattle. This immense stock range is well watered and has good shelter in its breaks and canyons. The grass is very nutritious, being black gramma and blue joint, and in most years is cut for hay, yielding as high as 2 tons to the acre. Fortunes have been made in Mora County by stock raising, and the man who possesses capital, some experience, and business ability can invest money to no better purpose than in this industry.

AGRICULTURE.

The county leads in agriculture. Together with Taos County it was the granary of the Southwest for many years, and before the advent of the railroads caravans came from far and near to secure wheat and other agricultural products. Even to-day from 25 to 50 wagons, loaded with agricultural products, are on the road daily from the Mora Valley to Las Vegas or to Wagon Mound. Five acres produce 13,665 pounds of oats, or 85 bushels to the acre. Potatoes yield from 3 to 5 tons per acre, Mora County being one of the few parts in the Southwest where potatoes are raised successfully. With few exceptions irrigation is needed to raise crops. But this is a blessing, for irrigation gives rain when needed and withholds it when not wanted. This insures perfect

crop conditions from seedtime until harvest. The principal crops are wheat, oats, alfalfa, corn, barley, rye, potatoes, and vegetables. Horticulture is a very successful pursuit, and the fruit raised here will stand comparison with that raised anywhere in the United States. Its flavor is unsurpassed and in size and color it has no equal. From the Mora and adjoining valleys 15,000 pounds of oats are shipped annually and about 2,000,000 pounds of corn. Enough wheat is raised to supply and keep busy the year around one modern roller mill and six water-power grist mills.

As an example of what capital and energy can do in the agricultural line here the La Cueva Ranch Company can be cited. The company purchased its land in 1880 when there were no fences on it, only one small irrigating ditch, and only a very small portion of the land under cultivation. To-day the company owns the prettiest valley in the county. The small ditch has been widened to an 8-foot canal, three reservoirs have been built, and over 2,000 acres are under cultivation, while there is sufficient water to irrigate over 3,000 acres. The 2,000 acres are in cereals, alfalfa, and orchards. About 1,200 steers and several hundred hogs are fed on the ranch annually, and there is sufficient fodder left to rough several thousand cattle and horses through the severest winter and spring. Sixty to 80 hands are employed on the ranch. The company owns about 100,000 acres. A flouring mill and large store are maintained by the company, which is realizing handsomely on its investment. Cabbages weighing from 40 to 50 pounds are not a rare product, and the soil seems peculiarly adapted to the raising of onions, carrots, parsnips, turnips, radishes, lettuce, celery, and asparagus. The home seeker can purchase land already under cultivation at from $10 to $40 per acre. Mora County produces sugar beets very rich in saccharine matter and yielding a heavy crop to the acre. The extraordinary purity of these beets and their high per cent of sugar have created a demand for them, and quantities have been shipped to the Colorado beet-sugar factories as an experiment; but, owing to the cost of freight and the difficulty of taking the beets to the railroad, sugar-beet raising is not as profitable as it would be if a sugar factory or two were located nearer to the beet field. Labor is cheap, water power abundant, and fuel easily secured, factors which would contribute much to the success of beet-sugar factories.

The following are the principal agricultural valleys: The Mora and Agua Negra Valley, nearly all under cultivation, is 22 miles long. In its narrowest place it is 400 yards wide for the length of about 12 miles; the other 10 miles are from 2 to 3 miles wide. The Cebolla Valley is 10 miles long and from 1½ to 3½ miles wide. The Guadalupita Valley is 5 miles long and 3 miles wide along the Guadalupita, and then runs 10 miles to Lucero, averaging about a quarter of a mile in width. The Llano del Coyote Valley is about 3 miles long and 1 mile wide. The La Cueva Valley, not including the 100,000 acres of the La Cueva Ranch Company, has an area of about 14,000 acres. The Golondrina Valley has an area of 5,000 acres. The Cherry and Watrous valleys produce alfalfa principally, although 30,000 pounds of grain is raised annually, being used mostly in fattening cattle, there being about 20,000 head of cattle in these two valleys. Besides these valleys, which all have irrigation systems, there are the Lower Cebolla, Buena Vista, Carmen, Gascon, and other small valleys that are very productive.

HISTORY.

Mora is the Spanish word for raspberry, the first settlers naming the section thus on account of the abundance of wild raspberries. Up to 1830 the county was the hunting ground of Indian tribes who held undisputed sway. In 1832 the first attempt was made by white men to settle on the present site of Mora, but the settlers were driven off by the Indians and a number of them were slain. However, other attempts were made, and in 1840 the settlers made a brave stand against the Indians and from that day the white men held the upper hand. The Mora Valley was at that time a dense forest and great hardship was endured in clearing the lands and building homes. Often a white man would be killed at his own door by marauding Indians, and it was not uncommon for women and children to be carried into captivity. The Mexican Government furnished no protection, and the settlers had but rude weapons with which to repel the attacks of the savage hordes. The Government, however, gave a large grant of land to 76 of these sturdy men. In 1847, during the war with Mexico, these people were intensely loyal to Mexico. Newcomers from the States about this time were massacred, and the American troops who appeared soon afterwards, as a punishment, laid the town of Mora in ashes. After the annexation these people were as loyal to the United States as they had been to Mexico, and many of them fought in the Federal ranks during the civil war. In 1860 the county of Mora was created out of part of the county of Taos. It had seven precincts then, one of the precincts, No. 4, Rayado, later being erected into the counties of Colfax and Union. Being off the line of railroad in greater part, many primitive ways still prevail side by side with advanced civilization, adding not a little to the picturesqueness and charms of the section.

SETTLEMENTS.

Wagon Mound and Mora are the principal towns in Mora County and are treated under the head of "Cities and towns of New Mexico."

Watrous, on the San Miguel County line, is next in importance as a shipping point, being the second largest settlement on the Santa Fe Railway in the county. Alfalfa and fruit are raised to a large extent around Watrous. There are two large stores, a blacksmith shop, two churches, and a schoolhouse. One and a half miles from Watrous the Santa Fe Railway is operating a stone quarry which at times employs from 300 to 400 men, supplying ballast for the railway track. Two train loads of stone are shipped daily. Population, 350.

Cleveland, better known as San Antonio, lies 3 miles west of Mora, in the Mora Valley. Two stores, a sawmill, and post-office are here. Population, 600.

Agua Negra is 4 miles west of Mora, also in the Mora Valley. It has a post-office, one store, a Protestant church, a mission school, and a sawmill. At this point the main road to Mora starts. Population, 500.

Rito de la Agua Negra is 15 miles west of Mora and is the center of the best oats and potato producing valley in the county. It has two stores, a Protestant church, a Catholic church, and Protestant mission school. Population, 600.

Cebolla lies in a rich valley divided from the Mora Valley by a mountain range. A large reservoir supplies irrigation water to the many fertile farms, wheat, hay, and oats being the principal products. Population, 400.

La Cueva is situated 5 miles east of Mora and is supplied with water from the Mora River. It is the headquarters of the La Cueva Ranch Company. A Catholic and a Protestant church and a Protestant mission school are maintained. There are also two blacksmith shops at the place. Population, 500.

Golondrinas lies 13 miles east of Mora and 15 miles west of Watrous. The surrounding valley is watered by the Mora and the Cebolla. Farming and stock raising are the principal industries. Alfalfa and other hay, all kinds of cereals, legumes, and fruits are the principal products. The settlement has one store and a post-office. Population, 250.

Cherry Valley is 15 miles east of Watrous, and farming is pursued here in accordance with the most modern methods. The valley is watered from the Mora River, ditches being taken out on both sides of the river and watering thousands of acres. Alfalfa, corn, oats, and all kinds of fruits are raised. Vegetables attain an immense size. Hundreds of cattle, fat and sleek, roam on the adjoining mesas, while sheep graze peacefully by the thousands in this section. Population, 150.

Ocate is 25 miles west of Wagon Mound, near the dividing line between Mora and Colfax counties. There are 1,200 settlers in this fertile valley. Ocate has 5 general stores, each carrying a stock that would do credit to a city store. There are 2 churches, 4 schoolhouses, and several blacksmith shops. The town is most beautifully situated, being surrounded by high well-timbered mountains. The Ocate Valley is dotted with beautiful meadows, and about 5,000 tons of hay are harvested annually. The Ocate Creek is the dividing line between the Mora grant and the public domain. Many thousands of cattle, sheep, and horses can be seen grazing around Ocate, making a picture of peace and plenty. The valley was settled fifty years ago, every foot of land being disputed with hostile Indians, and to-day a certain part of the valley is known as Corral de los Apaches. The valley is exceptionally well watered, the Ocate Creek being formed by several sparkling mountain streams which come down picturesque canyons.

Fort Union lies 8 miles north of Watrous. It has a romantic history. The caravans on the Santa Fe trail, in the early fifties and sixties, often made it a haven of refuge. A stage carried the mail from and to Kansas City once every two or three months, and later on monthly. Freight wagons and the prairie schooners made the trip in six months, and some took a whole year to make a return trip. The place was to the traveler an oasis and a bulwark against the marauding Indians. The old fort is 6,700 feet above sea level and situated in a valley 25 miles long and 5 miles wide. The Turkey Mountains lie to the east, while to the west rise the majestic slopes of the Rocky Mountains. The fort was abandoned in 1891. An extinct crater lies between it and Ocate, and for many miles around lava is piled up.

Guadalupita is situated 12 miles north of Mora in a beautiful valley surrounded by high mountains. The valley round about is well watered by several small streams, the chief of which is the Coyote, which gets

its flow from the Black Lakes, in Colfax County. There is a sawmill, general store, a church, and a school in the settlement, which also has a post-office. Hay, grain, potatoes, and legumes are raised in large quantities, but the chief industry is stock raising. Many thousand sheep graze in the hills, and on the mountains browse many herds of cattle. Grass comes very early in the spring, and therefore cattle do exceptionally well. The winters are mild. The road to the Black Lakes, Cimarron, Elizabethtown, and Taos passes through Guadalupita, crossing the Coyote 23 times in the canyon. Many a fishing party finds its way to this canyon or to the Black Lakes, where trout fishing, as well as hunting, yields excellent sport. Population, 250.

Turquillo is 6 miles north of Guadalupita. There are two sawmills in the valley, with an almost inexhaustible supply of timber to draw on. Hay, grain, and the legumes are the principal crops. Potatoes, however, are grown to an immense size. A number of promising mineral prospects are in the near-by mountains, but not developed to any extent. Population, 350.

Coyote is 7 miles northeast of Mora. It is in a narrow valley about a mile wide, with high mountains and bluffs on all sides. Stock raising and agriculture are the main industries. A general store and a post-office are found here. There are several fine orchards in the valley. A concentrator situated there is idle at present, although considerable work is being done on the fine mineral prospects in the vicinity. Copper is the principal ore, some of it assaying as high as 85 per cent, besides carrying gold, silver, and lead. Population, 200.

Llano del Coyote is 2 miles east of Coyote. Its resources are chiefly stock raising and farming. It has two stores, one church, a school, and a blacksmith shop. It is situated in an open valley, watered by the Coyote. Population, 300.

MORA COUNTY'S FUTURE.

Now is the time to settle in Mora County. The building of branch railroads into the county will greatly increase land values and will bring many opportunities for the establishment of new industries, the development of latent resources, the building of new towns and the growth of the older settlements. With its ideal climate, its abundance of water, its undeveloped resources, Mora County promises in the near future to become one of the most densely populated and richest sections of the great Southwest.

FINANCIAL STATEMENT OF MORA COUNTY.

Cash balance, January 1, 1903		$10,581.68
Receipts, January 1, 1903, to July 1, 1903, tax collections	$12,312.96	
Receipts, January 1, 1903, to July 1, 1903, other sources	5,787.34	
		18,100.30
Total to be accounted for		28,681.98
Remittances to Territorial treasurer	4,515.15	
Disbursements for all county purposes	12,940.33	
		17,455.48
Cash balance, July 1, 1903		11,226.50

Bonded indebtedness.

Title of bond.	Law of issue.	Amount outstanding.	Date of bond.	Rate of interest.	When interest payable.	Place of payment of principal and interest.	Time to run, or option.	When due.	Provision for payment.
				Per ct.					
Current expense bonds.	1889	$70,000.00	8/1/1899	6	January and July.	First National Bank, New York City.	30 yrs.	1919	None.
Fractional bonds.	1897	6,641.54	8/2/1897	6	.....do.....	Treasurer, Mora, N. Mex.	1907	1917	Do.
Floating debt		[a]22,927.96							
Total debt.		99,569.50							

[a] As reported by county clerk.

Assessed valua tion, 1903, $1,175,823.

Public improvements.

Court-house:	
Value of land and buildings	$30,500
Value of furniture and fixtures	3,000
Schools:	
Value of land and buildings	5,350
Value of furniture and fixtures	1,250
County jail:	
Value of land and buildings	6,000
Value of furniture and fixtures	7,360
Other county buildings:	
Value of land and buildings	1,000
Value of furniture and fixtures	100
Bridges	500
Total value	55,060

OTERO COUNTY.

Area, 6,870 square miles. Population, 8,000; census of 1900, 4,791. Assessed valuation, $1,570,864. County seat, Alamogordo.

Officials.—County commissioners, O. D. Warnock, E. Prado, J. C. Tucker; probate judge, R. Lopez; probate clerk, W. K. Stalcup; sheriff, J. Hunter; assessor, T. F. Fleming; treasurer, I. N. Jackson; superintendent of schools, J. E. Edgington; surveyor, J. E. Edgington.

Newspapers.—The Alamogordo News, Alamogordo; The Otero County Advertiser, Alamogordo; The Alamogordo Journal, Alamogordo; The Tularosa Democrat, Tularosa; The Cloudcroft Silver Lining, Cloudcroft.

Post-offices.—Alamogordo, Tularosa, La Luz, Mescalero, Three Rivers, Mayhill, Upper Penasco, Weed, High Rolls, and Jarilla.

Less than six years ago the part of Doña Ana, Lincoln, and Socorro counties which is now comprised within the area of Otero County was practically an uninhabited, arid country, excepting the small agricultural settlements at Tularosa, La Luz, and Weed, a few prospectors in the Jarillas, and several widely scattered cattle ranches, there being but a few over a thousand permanent settlers in the whole region. In the fall of 1898, however, several Pennsylvania capitalists and promoters, seeing the great possibilities for future wealth which the timber in the Sacramento Mountains, the coal beds in Lincoln County, and the mineral indications of the Jarilla and other mining districts in Otero, Lincoln, and adjoining counties offered, built a standard-gauge railroad from El Paso over 80 miles of almost barren country, founded a city in the desert, and touched the whole section as if with a magic wand and awakened it from its slumber into an active life and growth; for to-day, mainly owing to the enterprises inaugurated by these men, the county numbers 7,500 people and has an assessed valuation of over $1,200,000, in which the railroad is not included. The legislature which met in 1899 created that section into Otero County, named thus in honor of Governor Miguel A. Otero.

Otero County is bounded on the east by Chaves and Eddy counties, on the north by Lincoln and Socorro counties, on the west by Socorro and Doña Ana counties, and on the south by the State of Texas. Its main development has thus far been in its northern half, the southern and southeastern parts being still mostly an arid grazing plain, broken by low hills, several isolated mountain groups, and but very sparsely inhabited.

STATISTICS.

The area of Otero County is 4,396,635 acres, or 6,870 square miles, the county being almost as large as the State of New Jersey or Massachusetts. It is the fifth county according to size in the Territory. Of the total area almost 4,000,000 acres are still subject to entry under the Federal land laws.

During the fiscal year ending June 30, 1903, 23,359 acres were entered, 18,258 acres are being taken up as homesteads.

Land can be had practically for the asking, the requirements of the Federal land laws being easily complied with. The land offices for Otero County are located at Roswell for the eastern part and at Las Cruces for the western part.

Over 2,500,000 acres are adapted for stock range, while the White Sands Desert comprises 138,240 acres in Otero County, and the Lincoln Forest Reserve 68,845 acres in the county.

POPULATION AND WEALTH.

In population the county is fifteenth among the 24 counties of the Territory, the census of 1900 giving it 4,791 inhabitants, or 1 inhabitant to every 1¼ square miles of area. There are only 108 illiterate white people of voting age in the county, and the foreign-born voters number 228. The population of the county by precincts, according to the census of 1900, is as follows: Alamogordo, 1,524; Tularosa, 752; Mescalero Apache Indian Reservation, 554; Weed, 514; La Luz, 444; Fresnal, 317; Upper Penasco, 286; Mescalero, 157; Three Rivers, 143; Jarilla, 100.

Since the census of 1900 Alamogordo has grown to a population of 4,000, and 500 settlers have located at Cloudcroft and vicinity.

According to the assessment returns for 1903, the assessed valuation of the county is $1,570,864, exclusive of the railroad property.

That the credit of the county is excellent is shown by the fact that an issue of $15,000 bonds for the purpose of building a court-house was sold for $15,753, the cost of lithographing the bonds to be borne by the purchaser. While industrially in its very infancy, the census of 1900 credits the county with 13 industrial establishments. This does not include the large sawmills at Alamogordo nor the railway machine shops, each of which employ several hundred men in Alamogordo.

MOUNTAINS AND RIVERS.

The mountains of Otero County, although all belonging to one system, are broken into groups known as the White, the Sacramento, the Jarilla, the Guadalupe, the Cornuda, and the Hueco mountains. Mineral indications are found in all of these mountain groups, but it is in the White Mountains and in the Jarillas in which the most prospecting and development work has been done.

The rivers of Otero County are but small streams, most of them periodical in their flow and many having no outlet, losing themselves in the sands. Tularosa Creek, Sacramento Creek, the Lost River, the headwaters of the Penasco, of Eagle Creek and many lesser streams flow from the foothills down picturesque canyons out into the open table-lands.

A plan is now under consideration to construct an immense dam in the Rinconada Canyon, north and east of Tularosa. The length of the dam on top will be about 500 feet, with an average length of 150 feet, and a height of 100 feet. This large dam will receive its supply of water from a watershed having an area of 500 square miles. The watershed is washed by mountain snows and seasonable rains and there

will be no sediment to amount to anything carried down into the reservoir. When this immense natural basin is filled it will contain water enough to irrigate 20,000 acres of the valley.

THE LIVE-STOCK INTERESTS.

The live-stock industry is one of the most important factors in the prosperity of Otero County. There are 40,000 head of cattle in the county and 75,000 sheep, most of which are owned in adjoining counties. Between Fort Bliss, on the south, and Jarilla, toward the north, the plain is a vast cattle range, which from Jarilla extends more broken to the north into the adjoining counties. Wells have been or are being drilled by the larger cattle owners, and other means of developing a water supply are being employed with success. The ranges are well equipped with ranch houses and modern appliances and machinery. There are some 20,000 goats in the county, the high table-lands and foothills of the mountains furnishing excellent pasture for sheep and goats, and many of the newcomers in the county find goat and sheep raising a very profitable business in which to engage.

Range cattle fatten the year around, and the Angora goat surpasses in Otero County the record of his native breeding grounds, being better fleeced and fattened and bringing more money to his owner than in his Asiatic home. Otero County mohair is annually adding to its already gilt-edged commercial repute. But small capital is required in Angora goat raising. Many of the cattle owners are acquiring large tracts of land, fencing them, digging wells, building irrigation works, and making them model stock ranches, but there are still over 3,000,000 acres of public domain that are open range, besides a forest and Indian reservation.

AGRICULTURE AND HORTICULTURE.

Wherever water touches the soil in Otero County vegetation is luxuriant. All the crops and fruits of the temperate zone reach a perfection in Otero County not excelled anywhere else in the world, and some success has been attained in raising fruits of the semitropic regions.

In the mountain foothills and valleys a natural subsoil irrigation exists, fed from the seepage of subterranean water sources, while the prairie lands are eligible alike to surface and storage, canal and well-water irrigation, any scarcity of surface water during the summer being supplied by the storage reservoirs. Near Tularosa a company will construct this winter a canal with storage-water reinforcement—which will cover 10,000 acres, while other similar irrigation enterprises are in contemplation.

Well water is reached at a depth of from 20 to 50 feet and can be brought cheaply and abundantly to the surface by pump, windmill, or otherwise. The Lost River is a subterranean water course that traverses a large area and could be developed into an almost exhaustless irrigation source. The waters of this underground flow approach in many places to within 3 feet of the surface, with 50 feet as a maximum pumping depth, thus placing this exhaustless subterranean stream at the ready service of irrigation, pump as well as canal storage reservoir.

Both the subsoil areas and the lower irrigation areas of the county have a varied and prolific production, the field, garden, orchard, and meadow being extensively represented.

Apples reach a girth of 18 inches and a weight at times of over 2 pounds; peaches pull the scales as low as 1¾ pounds and pears 1¼ pounds; with plums, apricots, quinces, etc., in proportion. Grapes weigh as high as 3 pounds per cluster and include all varieties known to the vineyard. Figs make a yearly timber growth of 2½ feet and mature fully with an excellent flavor. Insect pests are absent almost entirely.

English walnuts, almonds, pecans, and other nuts flourish, the nut crop annually increasing in yield and in export value. Experiments are now being made with the date palm, with some prospects of complete success. All fruits, mammoth in size as they are, retain to the full their delicate flavor.

Vegetables are enormous, alike in size and yield, the onion, for instance, being at times 20 ounces in weight, while bell peppers get to be 12 to 15 inches in girth. Celery commands fancy prices in the Galveston, Denver, and Kansas City markets, while cantaloupes are par excellence. Some successful experiments have been made in raising cotton and tobacco on a small scale.

Oats return as high as 100 bushels to the acre and corn attains a height of 11 feet, other grains displaying kindred growth and yield, while alfalfa and the ordinary hay grasses are of luxuriant harvest. Otero County was awarded the first prize for cereals at the territorial fair at Albuquerque in 1901.

In the vicinity of Three Rivers, Tularosa, and other settlements the lands are irrigated and the finest fruit in the Southwest is raised there. The peaches that took the prize at the World's Fair at Chicago were raised on P. Coughlan's farm at Three Rivers.

The entire region in the northern part of the county is decidedly picturesque. The mountains rise to a height of nearly 13,000 feet above the level of the sea, and the scenic attractions of the peaks are equal to anything that Colorado has to offer. A large quantity of gramma grass is found upon the pastures on the foothills and far out into the plains, and thousands of heads of stock find abundant feed with plenty to drink from the mountain springs.

As fast as the country in the Sacramento Mountains is denuded of merchantable timber the Alamogordo Lumber Company sells the land in 40-acre tracts at $1 per acre. The land is fertile and adapted to truck gardening, potatoes especially yielding well. The rainfall is abundant in that section so as to dispense with the necessity of irrigation and the soil is exceedingly fertile. It is the natural home of the potato, which in most other parts of the territory is raised but with slight success. The county is remarkable for its wealth of grasses, which assure the best of dairying. The opportunity to raise a wide variety of vegetables is unsurpassed.

The high plateau of the Sacramento Mountains covers an area from 60 to 70 miles in length and 15 miles in width. Farmers are rapidly settling in that locality and they find a ready market in the county for all manner of ranch and farm products. Every ranchman is evidently in prosperous circumstances, for a railroad has brought a market to his very doors and the distance is so far to other agricultural sections

that he has practically no competition and can command top prices for everything that he raises.

The amount of land now under cultivation in Otero County aggregates 8,000 acres, situated in the following portions of the county: Mescalero Indian Agency, 1,600 acres; Penasco region, 1,800 acres; Fresnal Canyon, 1,300 acres; Three Rivers, 800 acres; Tularosa Canyon, 80 acres; Sacramento River Valley, 600 acres; Tularosa and vicinity, 400 acres; Agua Chiquita, 400 acres; Weed, 400 acres; La Luz Canyon, 200 acres; Silver Spring Canyon, 150 acres. It is estimated that there are fully 100,000 acres of fine farming land in the county that can be utilized for ranch purposes without irrigation. In the mountain region no irrigation is required except for cabbage plants and tender vegetables which demand water before the spring rains commence. Wells are to be bored for artesian water and this will bring a large area under cultivation.

The valleys and plains in the foothills and adjacent to the Sacramento Mountains furnish one of the best fruit-growing sections in the United States. There are now 23,500 fruit trees and 24,000 grape vines producing fruit in the county. The fruit trees are located in the following places: Three Rivers, 5,000 trees; La Luz and vicinity, 8,500 trees; Tularosa, 4,000 trees; Sacramento Mountain country, 6,000 trees; the Tularosa country has 15,000 grape vines; La Luz, 6,000, and Three Rivers, 3,000. Previous to 1899 there was no way of getting the fruit to market, and each season's crop was almost a total loss except for the small amounts required for home consumption. From time to time a few of the orchard owners tried to dispose of their fruit by hauling it over the rough mountains to Roswell, Carlsbad, White Oaks, Nogal, and El Paso, distances varying from 80 to 120 miles, but the cost of transportation and the time required in disposing of the fruit made the experiment unprofitable. With the railway facilities now available it is possible to dispose of each season's crop without difficulty, for the market embraces the whole Southwest. Very few of those now engaged in fruit raising have made horticulture an exact science, but the methods employed in California and other great fruit-raising sections will come into general use and larger profits will then be realized.

TIMBER RESOURCES.

The timber belt of Otero County is estimated to be 20 by 80 miles in extent, containing the heaviest timber in the region from the Mescalero Indian Agency south to the headwaters of the Sacramento River, including the Toboggan, Weed, and Penasco districts.

For years people in the Southwest had heard of the great tracts of timber in the Sacramento Mountains, but information as to the same had been rather of a vague nature. But when the El Paso and Northeastern Railway not only reached the big timber but actually got up into the heart of the vast forests, it was realized that a valuable country had been opened. Every appliance and convenience for cutting and hauling the logs to the big mills at Alamogordo have been put into operation by the railroad company and the fine sawmills at Alamogordo, equipped with the latest and most improved machinery of the century, are handling 200,000 feet daily of lumber brought down in log form over the tramway known familiarly as the corkscrew road.

There are mines in New Mexico and Arizona that would use up much of the mill's product if the orders could be filled, to say nothing of the increasing demand from northern New Mexico alone for mine timbers. As to the duration of the supply, it is figured that the stumpage of the Sacramento tract south of the reservation amounts to 1,000,000,000 feet. Experts state that the supply can not be exhausted for many years, even though the output be doubled. The extensive operations of the company furnish lumber to the El Paso and Southwestern markets at a much less figure than Louisiana and Texas concerns can provide it. The timber averages in size from 18 inches to 2 feet in diameter, and occasionally timber is cut that is too large for the band saws of the mill to handle. One of the largest trees felled measured 6 feet 1 inch in diameter, and made ten 16-foot saw logs. Pine, white spruce, red spruce, and oaks are the classes of timber most abundant. The red spruce furnishes the largest timber.

A factory in connection with the sawmills at Alamogordo manufactures sashing, doors, blinds, moldings, and everything used in house building. The mills are equipped with the best of machinery and every particle of the timber is utilized. The slabs are worked into pickets, boxing, laths, wainscoting, etc.; the bark and the sawdust are used for fuel in generating power for the mills.

MINES AND MINING.

The mineral resources of Otero County are varied and rich. It is principally in the White Mountains and in the Jarillas that the prospecting and development work has been done.

The White Mountains are formed of granite, schist, and other metamorphic rocks, interspersed with dikes of porphyry and veins of mineral-bearing quartz and spar. Rich leads would long ago have been developed but for the fact that Indian ownership has kept prospectors away. However, a few prospectors have managed to locate claims, the ore from them assaying as high as $600 to the ton in gold and silver and other ores carrying 50 to 70 per cent in lead. The finding of copper and at Ruidoso of valuable galena leads are reported.

The Jarilla mining district is now the most important mineral field in Otero County. Since the railroad reached the locality, development work has been carried on extensively and shipments have been or are being made from the Nannie Baird, the Lucky and other properties. Good placer diggings have also been opened, some times yielding as high as $8 per day per miner with the simple machinery that is employed. The well known De Meules turquoise mines have lead to large copper deposits. The mines are now worked for their copper ores. The main shaft of the Philadelphia Copper Company has exposed a good body of copper and gold ore.

There are vast quantities of 4 to 7 per cent copper ores in this camp. All the necessary fluxes, also the fuel, coal, and coke, are near at hand for a smelter which will undoubtedly be erected either at Alamogordo or Jarilla at some not distant day.

The entire district is mineralized, and in the contact and blanket veins shows immense outcroppings of iron, under which exploration has developed large copper deposits carrying a liberal quantity of the precious metals, as in the Lucky, in which the vein matter attains a thickness of over 30 feet, and the Nannie Baird, in which the vein is over 9 feet wide.

The veins of the Jarillas carry iron and copper sulphides, with occasionally some sulphides of lead and zinc, and more or less quartzose and gold bearing in character. Another characteristic cropping is what is popularly termed garnet and epidote, which occurs in veins in the sedimentary and contact formations. This peculiar outcropping, as is the case in Arizona, is considered as a certain indication leading to copper-bearing ores. Drill holes to a depth of 250 feet have shown the existence of four blanket veins in the sedimentary rocks. The dikes of diorite porphyry, called by the miners of the district trachyte dikes, which intrude through the Plutonic belt, are penetrated by veinlets of mineral-bearing quartz. Some of these dikes are thoroughly impregnated with copper, as in some of the Lake Superior copper mines, and afford a rich shipping ore, and development of these in the Jarillas has shown increasing value with depth. In the Amarillo mine is a large mineralized dike, on the western side of which is a well defined fissure vein.

It might be truthfully said of the Jarillas, as was said of the Cripple Creek belt by a distinguished geologist, that "the whole porphyritic area is more or less impregnated with precious metals." The occurrence of very rich placer gold deposits, as well as of nuggets of native copper, indicate the existence of extremely rich deposits in place. Veins of argentiferous galena in calc-spar gangue are found in the lime and slate contacts.

The eruptive range known as the Jarillas lies in the center of the Sacramento Valley, which stretches for over 100 miles north and south, with the Organ Mountains on the west, and the Sacramento Mountains on the east. This valley was once the bottom of a sea. The Jarillas are about 9 miles long and 4 or 5 miles wide, composed of hills averaging about 300 feet above the surface of the plain, with valleys and small flats between. From time immemorial the Apache Indians had a village there, as it afforded a splendid outlook across the plain in every direction against hostile approach. Their pottery, corn-grinding implements, and other utensils are still found in quantities on the site. For ages past this little range has also been celebrated for its turquoise, the Aztecs having mined it extensively as well as the more recent Mexicans under the régimé of Spain and Mexico. The whole range is intersected with mineral veins. On the south end the principal mineral is copper, which often carries gold in large amounts.

Near the head of La Luz creek, about 10 miles from Alamogordo, a ledge of gold quartz has been discovered in which wire gold was apparent to the eye.

Quite extensive mining operations are being prosecuted on Tularosa Creek. One carload of ore has been shipped giving the shipper high returns, and numerous other prospects will soon ship. The ore is copper carrying good values in silver.

Near Alamogordo exist quarries of the finest limestone to be found in New Mexico. It commands 15 cents per barrel more in the markets to which it is shipped than the Texas limestone. Beautiful marble, susceptible of a high polish, as well as onyx, which is shipped as far as Germany, exist in large quantities near Alamogordo and will eventually prove of great commercial value. Deposits of lithographing stone have been discovered not far from Alamogordo, and indications of petroleum and gas have lately been struck in one of the canyons a few miles from Alamogordo.

Alamogordo is also on the high road to the smelter at El Paso of the mineral trains from the Oscuras across the boundary in Socorro County, of the mines in Lincoln County, of the San Andreas Mountains across the border in Doña Ana County, and of the coal mines at Capitan and White Oaks in Lincoln County. It is therefore an ideal site for a smelter.

THE WHITE SANDS.

The White Sands, extending into Doña Ana County, are among the great natural wonders of the Southwest. They are a most conspicuous feature in the landscape. They have a length of 40 miles and a width varying from 5 to 20 miles. They are easily reached from Escondido, Dog Canyon, Alamogordo, La Luz, and Tularosa, the distance varying from 15 to 20 miles. They are great dunes of white gypsum, broken into fine grains like sand, which move to and fro with the wind like the sand dunes on the seacoast. This gypsum sand, white as snow and fine as corn meal, evidently comes from an old lake bed, covering about 100 square miles, where the winds have been at work for ages operating a sand blast. The area of these sand hills is about 600 square miles, and away from the edges there is neither animal nor vegetable life, but along the edges there are found small groves of cottonwood trees, large areas of peppermint, and plants peculiar to the locality, some of them, owing to the chemical properties of the gypsum, being nearly colorless. The whiteness of the region under the full glare of the sun is so dazzling that one soon becomes blinded unless protected by goggles. Combined with other novelties en route, a day's jaunt in this region is a treat.

On these gypsum sands is the playground of the mirage, and here it plays its greatest pranks with distance, perspective, and color. Sometimes it raises the white hills high above the surrounding flat country, making them exceptionally conspicuous, and at other times covers them with verdure and nodding shadows, and again hides them behind an opaque wall. The gypsum sands have been analyzed at the New Mexico College of Agriculture and Mechanic Arts at Mesilla Park, and their constituents are gypsum, 97 per cent; calcium carbonate, 2.06 per cent; magnesium sulphate, 0.12 per cent; magnesium carbonate, 0.06 per cent; potassium sulphate, 0.07 per cent; sodium carbonate, trace; sodium chloride, trace. The lake bed from which this gypsum sand is derived was probably the mouth of an ancient river which traversed the valley from north to south and carried the gypsum in solution.

Experiments made with the sands for fertilizing purposes found them to be especially adapted for that use on certain soils. The experiments at the agricultural college demonstrated that the application of white sand in considerable quantities improved certain soils a great deal. In addition to the uses mentioned above, the sands are valuable for the manufacture of plaster of Paris and its various by-products. Sulphuric acid, which is largely used in leaching copper ores, can be manufactured from the sands, and with the advantages of cheap fuel and corresponding cheap power the great desert 20 miles west of Alamogordo may some day be utilized in commerce and be found a great source of wealth.

Cement is now made of the gypsum, at a factory at Alamogordo, and is used for building.

THE RAILROADS.

It is to the El Paso and Northeastern Railway Company that Otero County owes its recent marvelous development and the promise for its future. It enters the county in the south near Fort Bliss and traverses it to the northern boundary, where it enters the southeastern corner of Socorro County, and then after traversing it for a few miles enters Lincoln County and goes thence to Santa Rosa, where with the Chicago, Rock Island and Pacific it forms a junction. The railroad has several branches in the county. The Turquoise-Jarilla branch leaves the main line 45 miles north of El Paso, and penetrates the Jarilla Mountains, tapping rich and extensive gold, copper, fluxing iron, and turquois deposits. The railroad is developing the Jarilla district.

The 26 miles of railroad between Alamogordo and the famous scenic health resort of Cloudcroft, in the Sacramento Mountains, constitute a most notable triumph of nineteenth century railroad engineering. This cloud-piercing steel trail is standard gauge and follows a succession of sinuous 30° curves with from 3 to 5½ per cent grades, nearly 1 mile of actual elevation being conquered between Alamogordo and Cloudcroft. The Cloudcroft Railway also taps the great Sacramento Mountain timber growth which supplies the sawmill of the Alamogordo Lumber Company. A branch line runs to the Capitan coal field in Lincoln County.

The connection of the El Paso and Northeastern Railroad with the Chicago, Rock Island and Pacific system makes the former part of a great highway for transcontinental travel and brings additional fame and prosperity to Otero County. Direct connection will also be given Otero County within another year with central and northern New Mexico and with Colorado by the construction of the Santa Fe Central Railroad between Santa Fe and Torrance, Lincoln County, connecting the Denver and Rio Grande Railroad system with the El Paso and Rock Island railways. Otero County has telegraph connection with the outside world and a local telephone system at Alamogordo. A long-distance telephone system has been completed to Cloudcroft and to El Paso.

CLOUDCROFT.

Otero County boasts of the most attractive summer resort of the Southwest, nestled at an elevation of 9,000 feet above the level of the sea, on a broad-gauge railroad that is an engineering wonder. The resort has a commodious hotel which is made the summer home of many El Paso people who desire to escape the fearful heat of that city in the summer months, and of many others who seek recreation and rest.

It is gaining in popularity with each year. This region long ago became famous through the glowing accounts given by travelers and hunters. Now, by a most remarkable system of railroad mountain climbing, this magnificent resort is opened up to all for delightful and health-giving summer residence. The air of Cloudcroft and all that mountainous region is an elixir redolent with the odor of balsam and fir. Tall spruce and pine are above and pine needles and mosses beneath. When it was decided to create Cloudcroft as a resort, the Sacramento Mountain country was carefully explored and a choice selection of 1,500 acres was made to be used for the pleasure and comfort of those

wishing to spend their summers in the mountains. Nature has done her part with a lavish hand and the resort management has laid the foundation plans, that the future can build on the broadest scale and in the most complete detail. Large and commodious hotels and public places of entertainment, groups of delightful summer cottages, beautifully prepared drives, and a thousand things to afford pleasure and recreation are the attraction of Cloudcroft.

THE MALPAIS.

Another of Otero County's natural wonders is the Malpais, in the northwestern corner of the county, the formation extending into Socorro and Lincoln counties. This is a vast deposit of black lava, about 40 miles in length and from 5 to 10 miles in width. It fills an ancient river bed, extending from a point to the northwest of White Oaks, southwesterly beyond Three Rivers. At the upper end is a crater, from which the lava was ejected. The lava is a black volcanic glass or variety of obsidian, traversed by thousands of deep crevices and cracks, and is practically impassable, except in a few places. In some localities a scant growth of grass has taken root and a few herds of antelope and deer have been observed, but in general it is an extremely barren tract of country. At its southern extremity are the Malpais Springs, from which a stream flows 2 miles or more and is then lost in the sands beyond. Here are found the only fish in the valley of the Lost River. They are peculiar to the locality and very small. The spring has been stocked with rainbow trout and they are doing splendidly. According to story and tradition, this lava deposit was formed after the Pueblo revolt of 1680. During this seismic disturbance the pueblos of Gran Quivira, Quarra, and others were destroyed by earthquakes and the character of the country changed to such an extent as to make it uninhabitable.

MESCALERO INDIAN RESERVATION.

A large fraction of the area of northern Otero County is taken up by the Mescalero Indian Reservation, for the opening to general settlement of which a movement has been set on foot. It was not until 1894, when Capt. C. V. Stottler took charge of them, that the Mescalero Apaches began to make strides toward civilization. Up to that time they had lived in tepees and had wandered at large over the reservation, which includes several hundred square miles of land. When this army officer came among them he found them wearing breech cloths, frequently drunk on mescal, and as disreputable and troublesome as it is possible for an Indian to be. A few had been educated by the United States Government at the Indian boarding schools at a distance, but these seemed to be the worst of the lot. They had gone back to long hair and incited others to disregard the orders of the officials.

Captain Stottler began by deciding that the Indians must be made to clothe themselves and have their hair cut. They objected to this. At last one of them was bribed to allow his locks to be shorn. He promptly got into so much trouble with the squaws that he persuaded other bucks to do as he had done. In this way half the tribe were given a hair cut. The remaining Indians were given their hair cut in a more forcible manner. Then every child over 5 years of age was

ordered to school, the parents who objected being sent to jail and put to hard labor. All power was taken away from the old chief, and the bucks were told that they had to go to work or starve.

Then they went to work. The work begun by Captain Stottler was continued by Dr. Luttrell who until last year was in charge of the agency. The result is that every Indian wears civilized attire and has otherwise adopted the ways of civilization; has a piece of land fenced in on which he raises grain and vegetables; has a good wagon, horses, and farm implements; a log house, comfortably supplied with necessary furniture and utensils; ten head of sheep for each man, woman, and child in the family. From a trouble-making Apache he has become a self-supporting man, and no longer requires Government aid. As a result beef rations are issued only to those Indians too old to work. At present there are on the reservations about 450 Indians, of whom 350 adults are divided into 128 families. With the exception of about 150 women and 40 men all are married. Among them they cultivate 90 farms, have 9,000 acres of land fenced in, and 1,200 acres in grain. They own over 1,000 horses, 5,000 sheep, 600 goats, and over 100 head of cattle.

There is now practically no reservation for the Indians in the sense of confinement, the present reserve merely protecting water rights and guaranteeing each Indian permanent possession of his lands and an opportunity to make a good living. There is excellent agricultural, extensive grazing, and very valuable timber land on the reservation. In the mountains are many indications of large ore deposits.

All of the children of the Mescalero Indian Reservation are in school, over 100 being in boarding school, on the reservation, and 7 at non-reservation schools. Attendance is compulsory. The school plant is in good condition, having electric lights, an excellent water system, and ample fire protection. The work of the school has been satisfactory in all departments, and pupils passing through the institution are being well fitted to take up some trade or follow the pursuit of farming on the lands of the reservation. The school farm of 200 acres is doing finely and is raising large crops.

CLIMATE.

The climate of Otero County, like that of the rest of New Mexico, is especially adapted to invalids, including those suffering from lung and throat trouble. The winters are very mild and the summers are delightful, of course, in the plain, being at times very hot during the afternoon hours, but always cool at night. The air is dry and bracing the year round and the percentage of sunshine is higher than anywhere else in the United States. The health seeker and the tourist are offered every accommodation of a progressive country and yet can get very near to the heart of nature.

SETTLEMENTS.

Alamogordo and Tularosa are described under "Cities and towns of New Mexico." All of the settlements have picturesque surroundings, green fields, and beautiful orchards. Among these are Threerivers, Cloudcroft, La Luz, High Rolls, Pinespring, Upper Penasco, and Weed. Jarilla is a mining camp and has a post-office. The stations on the El Paso and Northeastern Railway in Otero County, beginning

in the south and including its branch roads in Otero County, are Hereford, Hueco, Desert, Soledad, Jarilla, Turquoise, Escondida, Dog Canyon, Alamogordo, Tularosa, Temporal, Threerivers, Fresnal, Cloudcroft, and Oscura.

FUTURE OF OTERO COUNTY.

It is not difficult to foretell the future of Otero County. It is certain to become one of the richest, most prosperous, and populous of New Mexico counties. Its varied resources, its industrial opportunities, its climate, its progressive people, its manifold natural attractions have been brought to the attention of the world only lately and they are certain to attract new settlers and new capital for many years to come. The man who invests and settles in Otero County at this time is certain to reap rich returns in the not very distant future.

FINANCIAL STATEMENT OF OTERO COUNTY.

The total indebtedness of Otero County on June 30, 1903, was $49,102.03, classed as follows:

Cash balance January 1, 1903		$15,008.90
Receipts January 1, 1903, to July 1, 1903, tax collections	$16,072.36	
Receipts January 1, 1903, to July 1, 1903, other sources	7,977.58	
		24,049.84
Total to be accounted for		39,058.74
Remittances to Territorial treasurer	6,940.90	
Disbursements for all county purposes	22,921.31	
		29,862.21
Cash balance July 1, 1903		9,196.53

Bonded debt.

Date of issue.	Date of maturity.	Purpose of issue.	Rate of interest.	Amount.
	Years.		*Per cent.*	
July 1, 1899	10-20	Current expense	6	$5,000.00
January 1, 1901	10-20	Lin. & D. A. Co., Ind	6	20,000.00
November 1, 1901	10-20	Court-house	6	15,000.00
October 1, 1902	10-20	Jail bonds	6	7,500.00
Debt created by the legislature of 1901, chap. 39				1,602.03
Total indebtedness June 30, 1903				49,102.03

Public improvements.

Court-house:	
Value of land and buildings	$35,000
Value of furniture and fixtures	1,500
Schools:	
Value of land and buildings	34,300
Value of furniture and fixtures	2,500
County jail:	
Value of land and buildings	8,000
Value of furniture and fixtures	3,500
Other county buildings, value of land and buildings	300
Bridges	300
Total value	85,400

Valuation and taxation.

Assessed valuation of real property:	
Land, exclusive of improvements	$362,611
Buildings and improvements	295,762
Assessed valuation of personal property	563,758
Total assessed valuation	1,222,131
Less exemptions allowed	992,934
Total subject to taxation	1,129,197
Tax rate for county purposes, $1.52½ per $100; raised by county commissioners to	1,193,244

County funds, as follows:	Mills.
Current expense fund	5
General school fund	3
Court fund	3
Interest fund	2.5
Court-house repair fund	1.5
Road fund	.25

Total assessed valuation of property for 1903, $1,570,864.

QUAY COUNTY.

Area, 2,805 square miles. Population, 4,000. Assessed valuation, $750,000. County seat, Tucumcari.

Officials.—Commissioners, Isaac Barnes, J. P. Martinez, A. D. Goldenberg; probate judge, T. W. Heman; probate clerk, N. V. Gallegos; sheriff, J. A. Street; assessor, D. Stewart; treasurer, H. R. Neal; superintendent of schools, Milnor Rudolph; surveyor, J. Campbell.

Newspapers.—The Tucumcari Times and the Quay County Democrat, Tucumcari.

Post-offices.—Tucumcari, Dodson, Endee, Montoya, Puerto, Revuelto.

Quay County was created by the thirty-fifth legislative assembly in 1903, and was named in honor of Matthew Stanley Quay. Guadalupe and Union counties gave up the area to create the county, the greater part coming from Guadalupe County, now Leonard Wood County. The county seat was fixed at Tucumcari, a busy railroad center at the junction of the Chicago, Rock Island and Pacific Railway, the Dawson Railway, and the Choctaw Railway, which last named is under construction at present. These three railways traverse the county and give it ample railway facilities and have resulted in the coming of scores of new settlers.

Its area is 1,795,270 acres, making it one of the small counties of New Mexico, although it is more than two and a half times as large as the State of Delaware. It is bounded on the north by Union County, on the west by San Miguel and Leonard Wood counties, on the south by Leonard Wood County, and on the east by Texas.

Quay County is classed as a plains county, but it is by no means entirely level, the surface being broken by hills and peaks, which in spots rise to the dignity of mountains, all being foothills of the great Rocky Mountain system. There are many picturesque spots within the county, which is in the drainage area of the Canadian River in its northern part and in the drainage area of the Pecos River in its southern part. Besides the Canadian, the Pajarito is the principal water course. The Plaza Largo and the Trujillo are other streams, but are dry part of the year. Throughout the county are many lesser streams, dry part of the year, as well as basins or water holes, which are filled with water part of the year, forming beautiful lakes in the rainy season.

Being a grazing country the stock industry flourishes in Quay County. On its ranges are 200,000 sheep and 50,000 cattle. Tucumcari has become a great wool-shipping center, the grade of wool produced in the county being above the average. The mild winters, a good supply of water, and the railroad facilities make the county especially favorable to the stock industry.

Agriculture is also carried on upon a small scale, water for irrigation being supplied chiefly from shallow wells. The water can be raised by windmills or with gasoline engines. Along the Pajarito and

around Tucumcari there are many fertile farms. A beginning has been made in raising fruit, the climate being especially adapted for horticulture, apiaries, chicken farming, and other branches of husbandry.

Excellent building stone is found in the county, as well as clay for the making of brick.

The climate, like that of the rest of the Territory, is a specific for lung and throat trouble. The winters are mild, the summers are cool, especially the summer nights, and this, with the rarefied, dry, and pure atmosphere and the unbroken sunshine, present ideal conditions for the health seeker. The altitude of the county varies between 4,000 and 6,000 feet. The greater part of the county is still subject to entry under the Federal land laws, although around Tucumcari the land has been pretty well taken up by homesteaders who are erecting substantial houses.

Tucumcari, of which a description is given under the head of "Cities and towns of New Mexico," is the principal and only town in the county. There are small settlements at Dodson, Endee, Montoya, Puerto, and Revuelto, where post-offices and stores are maintained.

The physical, industrial, and climatic features of Quay County are akin to those of Union and Leonard Wood counties, and which are fully described under those headings.

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RIO ARRIBA COUNTY.

Area, 5,810 square miles. Population, 1900 census, 13,177; 1890 census, 11,534. Since then Espanola precinct of Santa Fe County has been added to Rio Arriba County. Present population of the county, 16,500. Assessed valuation, $981,665. County seat, Tierra Amarilla.

Officials.—County commissioners, F. A. Serna, A. C. de Baca, V. Valdez; probate judge, J. P. Lujan; probate clerk, B. C. Hernandez; sheriff, Alexander Read; assessor, E. P. Jaquez; treasurer, P. Esquibel; superintendent of schools, S. Roybal; surveyor, J. P. Rinker.

Newspapers.—La Luz, Espanola.

Post-offices.—Tierra Amarilla, Park View, Espanola, Tusas, Chamita, Alcalde, Coyote, Abiquiu, Gallina, Velarde, Dixon, Rinconada, Truchas, Cordova, El Rito, Canjilon, Vallecitos, Petaca, Hopewell, Chama, Monero, Lumberton, Dulce, and Rosa.

Rio Arriba County is bounded on the north by Archuleta and Conejos counties, Colo.; on the east by Taos, Mora, and Santa Fe counties; on the south by Santa Fe, Bernalillo, and McKinley counties, and on the west by San Juan and McKinley counties. Its area is 5,810 square miles, it being the eighth largest county of the Territory. It has more than five times the area of the State of Rhode Island, thrice the area of Delaware, a greater area than Connecticut, and is almost as large as Hawaii. Although a large part is covered by private land grants, yet almost 2,000,000 acres are still subject to entry under the Federal land laws. During the past fiscal year 4,281.79 acres of public land were filed upon by homesteaders and 217 acres of mineral land were taken up.

POPULATION.

According to the census the population of the county was 13,777 on June 30, 1900, or two persons to the square mile. The population at present is something like 16,000. Although San Juan County was organized out of part of Rio Arriba, yet the latter gained 4,500, or about 50 per cent in population from 1870 to 1900, over 2,000 of which was gained from 1890 to 1900. The growth during the present decade promises to be much greater, as land-grant titles have been settled, and its vast resources are certain to attract capital and settlers.

The county is one of the so-called native counties in which the Spanish language is still spoken to a large extent, although the younger generation speaks English, and there are many residents from the States, quite a number of them occupying positions of prominence and wealth. English is taught in all the public schools. The population of the county by precincts, according to the census of 1900, is as follows: Tierra Amarilla, 844; Park View, 811; Embudo, 789; Rio Arriba, 694; Espanola, 655; El Rito, 644; Chimayo, 622; Vallecitos, 617; La Joya, 616; Abiquiu, 551; Los Pinos, 541; Las Truchas, 466; Lumberton, 465; Rio de Chama, 439; Chamita, 404; Canjilon, 394; Coyote,

THE ESPANOLA VALLEY NEAR SANTA FE.

SORGHUM CANE, NEAR CARLSBAD.

366; Petaca, 341; Cebolla, 325; Chama, 300; Canones, 292; Ojo Caliente, 261; Gallina, 257; Quemado, 244; Arboles, 184; Monero, 177, and Good Hope, 174. The San Juan pueblo has a population of 465, and there are 829 Jicarilla Apache Indians on the Jicarilla Reservation. The people of the county live in greater part in the river valleys, more than one-half having their homes along the Chama and its tributaries.

While the county does not make a good showing upon the assessment rolls, yet it is one of the richest, the sheep owned there alone being worth as much as the total returned assessed valuation for 1903, which is $981,665.

The census of 1900 shows that the agricultural wealth alone amounted to $2,566,000 on June 30, 1900, and it is believed that the present total wealth of the county reaches $6,500,000.

TOPOGRAPHY.

The surface is very broken. In the western part the Continental Divide passes through it from north to south, and from it slope the foothills, high mesas, and canyons to the Rio Grande Valley, broken by mountain ranges and mountain knots. The principal ranges are the Cumbres, the Gallinas, the Sierra de la Miras, Jemez, and Cejita Blanca, while isolated peaks such as Pedernal Mountain, San Antonio Peak, Ortiz Hill, and Gallinas Peak are conspicuous landmarks. Several of these rise to an altitude of 13,000 feet, while the average elevation of the mesas is 6,500 to 9,000 feet and of the river valleys 5,000 to 7,500 feet. The mountains give a large drainage area, and in consequence there are many streams that at certain seasons of the year carry an immense amount of flood waters.

RIVERS AND IRRIGATION.

The county is in greater part in the drainage basin of the Rio Grande, although west of the Continental Divide the waters find their way to the San Juan and by it to the Pacific Ocean. The Rio Grande cuts across the southeastern part, leaving the Taos Canyon near Rinconada. A fertile valley spreads out south of Embudo to the White Rock Canyon. The principal tributary of the Rio Grande in the county is the Chama, along which and its tributaries 40,000 acres are under ditch and 22,000 acres are cultivated. The drainage area of the river is 2,400 square miles. The surface of this drainage area is greatly broken, being high and mountainous over the greater portion, affording a catchment area which, with the exception of the districts including the Santa Fe and Taos ranges, is unsurpassed. The valleys in general are narrow with steep slopes and shut in from the surrounding country by high, steep walls. There are several mesas of fine land in the northern and central portions, although they are as yet almost undeveloped. From the junction of the Chama with the Rio Grande to about 4 miles above Abiquiu the river flows through a broad valley from 1 to 25 miles wide and with considerable fall. This valley has been in cultivation for many years and is one of the most fertile sections of the territory. Above Abiquiu the river flows through a narrow canyon, there being but few tracts capable of cultivation until the Park View section is reached, where from La Puenta to Los Brazos is one of the best agricultural areas in the county. Above Park View

the river is confined to the canyon, having no irrigable lands between this point and the Colorado line. The tributaries of the Chama are fifteen in number and may be divided into two classes, those which flow through wide sandy valleys and the channels of which are broad near their mouths, thus affording much loss from seepage and evaporation in the lower portions, and those streams which are confined to more permanent channels and whose valleys partake more of the canyon character, thus showing comparatively little loss. Of the first class are all the streams below Cebolla, while those above are of the second class.

The Chama is an exceedingly muddy stream, its waters carrying great quantities of silt in suspension. This character is due to its tributaries of the first class, the waters of the second class being comparatively clear and free from silt, excepting in times of freshets. The rainy flow occurs in general during the months of July and August, and is characterized by freshets of great volume, which at times are very destructive to property. The following is a summary of the amount of water flowing in the tributaries of the Chama in the spring months: Brazos, 40 second-feet; Little Chama, 95 second-feet; Ojo Caliente, 75 second-feet; Puerco, 40 second-feet; El Rito, 33 second-feet; Canjilon, 28 second-feet; Nutritas, 26 second-feet; Lower Canones, 14 second-feet; Gallinas, Cebolla, Willow, each 12 second-feet; Nutrias, 10 second-feet; Canones, 8 second-feet; Frijoles and Oso, each 5 second-feet. The main branch of the Chama above the town of Chama flows at the rate of 300 second-feet. The total discharge of the Chama in three months at Abiquiu is 750 second-feet. By far the greater acreage is on the tributary streams in the mountains. This is explained by the fact that the streams display two distinct features in their course from the mountains to the Chama; first, an upper course characterized by deep canyons among the mountains, and second, a course characterized by sandy river beds of comparatively little fall. In the upper course there is never, or rarely, any scarcity of water, but in the lower sections along the wide valleys the seepage and evaporation are excessive and scarcity of water is frequent, especially since large areas in the hills have been denuded of their timber. The following is the acreage irrigated in the Chama district: From Espanola to the junction of the Chama and the Rio Grande, really situated in the Rio Grande Valley but irrigated by water of the Chama, and from Chamita to Ojo Caliente, 4,500 acres; from Ojo Caliente to Abiquiu, 1,500 acres; Abiquiu to La Puenta, 225 acres; Tierra Amarilla Valley, 900 acres; Ensenada, 1,650 acres; Brazos, 1,050 acres; Park View, 2,150 acres; Canones, 600 acres; Rio Puerco, 500 acres; tributaries, Rio Gallinas, 150 acres; Ojo Caliente, 3,250 acres; El Rito, 1,500 acres; Cebolla, 450 acres; Canjilon, 525 acres; Las Nutrias, 375 acres; Las Nutritas, 1,500 acres; Vallecitos, 150 acres; San Antonio, 900 acres.

A shortage of water has been felt the last few years on the Chama owing to the cutting of timber on the Tierra Amarilla grant. On the El Rito the water is wholly used, there being no surplus, and in years of drought the lack of water is severely felt. On the Gallinas the same conditions apply, and a shortage is also felt at times on the Coyote, a branch of the Puerco. With these exceptions there is a large surplus of water in all sections, so that all of the 40,000 acres under ditch could be irrigated and cultivated without any increase in the present ditch systems. The total irrigable acreage in the district is 100,000

acres, and with storage reservoirs could be more than doubled. The available sites for such reservoirs are many.

The headwaters of the Jemez, the Puerco, the Amargo, and Navajo are also in the county and small areas are cultivated along them. The Truchas is a small stream whose flood waters occasionally find their way into the Rio Grande from the east and along whose headwaters several hundred acres are under cultivation. The Rio de los Pinos, which rises in Colorado and flows into the Rio Grande at Antonito, Colo., also has part of its course in Rio Arriba County. The Vallecitos and Petaca or Servilleta are other tributaries of the Rio Grande along whose courses there are patches of irrigated lands. In the western part of the county are several fine bodies of standing water, such as the Horse Lakes and the Stinking Spring Lakes. From the western slope of the Rockies flow the Largo, Pinero, Blanco, Navajo, and Gobernador; all except the Navajo, which is a fine stream, carrying water only after rains and during the rainy season, and the remainder of the year are dry arroyos. The irrigation systems of the county are primitive and wasteful, and with modern methods many more acres will be brought under cultivation.

CLIMATE.

Rio Arriba County can hold its own with other parts of the Territory in reference to climate that is a specific for lung and throat trouble. The altitude ranging from 5,000 feet in the lower valleys to 9,000 feet on the higher mesas, affords sufficient range for all conditions, the general characteristics, dry and light air, a large percentage of sunshine, balsam air from pinon, cedar, pine, and spruce being the same in all parts of the county.

RAILROADS.

The only railroad that taps Rio Arriba County is the Denver and Rio Grande's narrow-gauge line from Antonito to Santa Fe, and from Antonito to Durango. The former enters the county near Embudo and leaves it near Espanola, a distance of almost 20 miles, while the latter enters the county at Big Horn and leaves it at Los Pinos, a distance of 12 miles, and reenters it at Cresco and leaves it at Juanita, a distance of 50 miles. A branch line built for lumbering purposes extends from Chama to Tierra Amarilla, a distance of 16 miles. Another line, the New Mexico and Southwestern Railroad, is under construction from Monero to Gallinas to exploit an extensive timber district. There is plenty of room in the county for railroad extension and development, as its resources would furnish a large tonnage, and new railroads would mean a great increase in population.

AGRICULTURE.

Together with stock raising, agriculture is the main industry. It was established many centuries ago by the Pueblo Indians and taken up in the Chama and Rio Grande valleys by the Spaniards three hundred years ago. All the grains, vegetables, and legumes of the Temperate Zone flourish in the irrigated sections, and some of the finest orchards and farms in New Mexico are found in the county. Crop failures are unknown in those districts which are well watered, for the

husbandman can water his crops when they need it and withhold the water when moisture would be harmful. He has no fear of drought in the growing season nor of excessive rains during the harvest. Alfalfa is a crop that pays well, and the fruit raised is superb. Experiments in growing sugar beets in the Chama and Rio Grande valleys have astonished experts for the high percentage and purity of the sugar contents of the beets raised. All that is needed to make the culture of the sugar beet a large and profitable industry is a sugar factory at some convenient near-by railroad point, such as Santa Fe. There is a flouring mill at Parkview, and large quantities of grain are sent to the flouring mill at Hobarts and Santa Cruz, in Santa Fe County, and to the flouring mills in the San Luis Valley, Colorado. The mining camps furnish home markets for agricultural and dairy products, and there are fine openings for enterprising farmers who will engage in truck farming, poultry raising, or dairying.

STOCK RAISING.

Rio Arriba County has some of the best stock ranges in New Mexico. It is estimated that some 500,000 sheep graze in the county, and that the wool production amounts to 2,000,000 pounds annually. It is not unusual for one owner to shear 15,000 sheep at one time and drive them to Chama to be dipped at the large dipping plant at that place. Cattle do exceedingly well, and there are probably 50,000 in the county. Of late years goats have proven very profitable, especially in the more mountainous sections, and it is estimated that there are now 25,000 goats here. Range horses also number several thousand. The comparatively mild winters, the nutritious grasses on the mesas, the abundance of flowing water, and the proximity to the railroad all combine to make Rio Arriba County a stock country par excellence.

MINING.

The county is destined to take a leading place as a producer of gold, copper, silver, lead, coal, mica, and other minerals. Enough development work has been done to demonstrate this fact beyond peradventure.

Gold has been found in paying quantities on the Tierra Amarilla grant, and many gold-bearing veins of value have been opened in the Headstone district, near Hopewell. This district is in the Vallecitos Mountains. South of Hopewell, at Petaca, large areas of granitic rock have been exposed, and in them quarries of merchantable mica are found. In the Cejita and Jemez Mountains of central and southern Rio Arriba County promising surface indications of gold, silver, and copper ores exist. The copper deposits in what is termed the Nacimiento region, covering the northwestern section of the Jemez Mountains, in Rio Arriba and extending south into Bernalillo County, are remarkable. The entire formation seems to be impregnated with copper. Besides, much low-grade material, immense kidneys of red and black oxide and native copper are often taken out at or near the surface. Galena ore that assays $40 per ton in silver and 30 per cent in lead has been discovered in the southwestern part of the county, a few miles from the Denver and Rio Grande Railroad. From the mica quarries near Tres Piedras, in the Petaca region, three to five carloads

a month of sheet and scrap mica have been shipped to Cleveland, Ohio, in late years, but of late the quarries have not been worked. The annual product was something like 7,500 pounds of sheet and 125 tons of scrap mica. The undecided question of mining on private land grants, which, however, promises to be settled soon by Federal legislation, has retarded the mineral development considerably; but in sections such as the Bromide or Headstone district, at Tusas and at Hopewell, where this grant restriction does not exist, good-sized mining camps have sprung up and scores of men are given employment. In the Bromide district two of the mines have become shippers, while about six others are on the point of becoming such. Having no treating plants of its own and being 12 to 15 miles from the railroad, the Bromide district necessarily depends for its profits on high-grade ore. With the progress of development work, reduction works and smelters will undoubtedly be erected, and a spur of the Denver and Rio Grande Railroad will be built into the camp. At present a very good wagon road connects the camp with the railroad.

The Colonial Mining and Leasing Company operates the old Bromide mine and has put in modern pumps to handle the heavy flow of water. The ore is a high-grade stephanite, carrying from 300 to 800 ounces of silver to the ton. The Bromide is the oldest mine in the district, and heavy shipments have been made during the past twelve years.

The Mexican King and Copper Company is developing a property in Cunningham Gulch. The War Eagle, Butterfly, and Horse Shoe are the company's principal claims.

The Sixteen to One makes a good showing of gold ore, and the vein has been followed 100 feet into the ground.

The Admiral Mining Company works the Dewey and the Blue Bird mines and has installed modern machinery to handle the water in the shaft of the former.

The Bromide Copper and Mining Company is working the Captain Jinks, the Big Four, the Wild Hog, the Johnny, and other claims. The Strawberry has a body of copper ore and has air compressors, machine drills, good pumps, steam hoist, and other modern machinery. The King Richard Gold Mining Company, the St. Michael's Mining and Milling Company, the Whale Company, the Pennsylvania Mining and Milling Company, the New Mexico Gold and Copper Company, the Pontiac Mining and Milling Company, the Belle Royal Mining Company, the Las Tusas Mining and Milling Company, the Mexican Gold and Copper Company, the Gold Pan Company, and Wayne Arriba Company, and a number of individual owners own promising mines and prospects at Bromide or in the near-by Hopewell and Las Tusas camps and are spending considerable capital in development work and putting in machinery. With a railroad spur and modern treatment plants, the Bromide district would employ at least a thousand men within a year.

The Chama River, a few miles above Abiquiu, contains extensive placer beds. These deposits of auriferous sand and gravel are situated on either side of the Chama and in the bed thereof about one-half mile from the junction with Canones Creek and 8 miles west of Abiquiu. They embrace several thousand acres, of which 1,000 or more acres have been exhaustively prospected. Pannings from almost any part of the prospected property show 36 cents in gold and at times run as high as $3 per cubic yard. St. Louis and Kansas City capitalists have organ-

ized three companies to develop these grounds with powerful steam dredges. A dredge has been built, but before its success could be demonstrated it was carried down the river by one of the summer floods. Arrangements are being made to take back the dredge to the placers and to resume operations.

Near Ojo Caliente, near Monero, and within half a mile of Chama there are good oil indications, and arrangements are being made to drill an experimental well on the Little Chama.

In the western part of the county, as well as near Abiquiu, there are outcroppings of extensive coal beds. At Monero several coal deposits are being worked successfully. About 50 men are employed, and the daily output is 175 tons, for which a market is found in Colorado and New Mexico. Monero mine No. 1 is operated by the Rio Arriba Coal Company. This coal is an extra good quality of bituminous coal, an especially good coal for domestic and steaming purposes. There are three workable veins from 3 to 4 feet in thickness. The Monero mine is opened by slopes, cross entries, and rooms. A slope has been driven 1,600 feet in depth upon the 4-foot seam and another slope 600 feet deep on a 3-foot 8-inch seam. The mine produced 40,000 tons of coal last year. The demand for this coal is far in excess of the supply, the production being curtailed by the scarcity of miners. The Kutz mine is also located at Monero. The output last fiscal year was 20,000 tons. The vein is 3 feet 6 inches thick. Fifteen men are employed. The depth of the slope is 600 feet.

The McBroom coal mine is situated 1½ miles east of Monero. The thickness of the vein is 3 feet, and the product last year was 1,500 tons. Five men are employed. The thickness of the drift is 200 feet. The coal is marketed at Creede, Colo., and in New Mexico.

TIMBER.

The lumber industry employs many men in Rio Arriba County and considerable capital is invested in it. There are three large steam sawmills—one near Brazos, one at Truchas, from which the product is hauled to the Denver and Rio Grande Railroad by a traction engine, and the other is at Lumberton—besides several portable sawmills. Many portions are magnificently timbered, while many hundreds of thousands of dollars' worth of timber have already been cut on the Tierra Amarilla grant. A new timber section is being opened in the vicinity of Gallinas. About 45,000 feet of lumber are cut daily and marketed at from $7 to $21 per 1,000 feet. The greater portion of the timber is pine.

INDIANS.

In southeastern Rio Arriba County is the famous San Juan Pueblo, situated in the beautiful Rio Grande Valley, across the river from Chamita. In the northern part is the Jicarilla Apache Reservation, well timbered and with good flowing water, comprising 415,713 acres. There are 829 Apaches on the reservation. A large part is covered with exceptionally fine timber. The Indians have about 625 acres under cultivation. The crops they raise are, however, meager, owing to the lack of water and primitive methods. A more ample and steady water supply for the future has been provided by the construction of irrigation works, including a reservoir that holds 3,000,000 gallons

and which will not only supply the new $70,000 schoolhouse built at Dulce, where the Apache agency is located, but also water for the irrigation of several hundred acres of land. The water is taken out of the Navajo River. The new school building will accommodate 125 pupils. A dormitory will be built which will increase the capacity of the school to 225 pupils. The Indians realized $6,000 last year from the sale of baskets, bows and arrows, and beadwork, in the making of which they are very skillful. The Methodists have established a mission on the reservation.

ATTRACTIONS FOR TOURISTS.

The scenery of this county, in many parts, is magnificent. In the Cumbres Range, which is crossed by the Denver and Rio Grande Railroad, some of the finest mountain scenery on the North American continent is found. The Rio Grande is extremely beautiful, and other parts of the county, especially along the mountain streams and canyons, are very picturesque. Erosion of the surface rock has resulted in many wonderful natural monuments and landmarks. Near Abiquiu, for instance, a very striking picture of the National Capitol appears on a canyon wall. The Brazos, the Little Chama, and other rivers are splendid trout streams, and in the mountains plenty of large game is found. In the southwestern part of the county there are interesting prehistoric remains, while the greater part of the Pajarito Cliff Dwellers' reserve, that is to be established by an act of Congress, is in southwestern Rio Arriba County. Good roads cut every part of the county, and to the tourist and health seeker the whole region offers many attractions.

CLIFF DWELLERS.

The Pajarito Cliff Dwellers' region is a tract of land lying in Rio Arriba, Bernalillo, and Santa Fe counties, between the Rio Grande on the east and the base of the Rocky Mountains on the west, the Chama River on the north and the Rito de los Frijoles on the south. It is 30 miles in length and 15 miles in width. It is best reached from the city of Santa Fe, Espanola, or Santa Clara. It is a plateau 6,000 to 9,000 feet in altitude, sloping downward from the west to the east. The northern portion is covered with grama grass and scattered cedar and pinon. The southeastern portion is covered rather thickly with a heavy growth of pine, spruce, and fir.

The entire plateau is evidently of volcanic origin, a stratum of light volcanic tufa, varying in thickness from 50 to 300 feet, being still in place. In places the mesa is cut by deep canyons, among them being the beautiful Santa Clara Canyon, with its sparkling trout stream and patches of cultivated land. The remains on the proposed reserve include cliff or cave dwellings, communal houses, carved stone lions, and picture writings. There is no other locality in which so extensive remains are found in so small an area. It is estimated that there are tens of thousands of these ancient structures, and from the Puye Mesa 2,000 cliff dwellings may be seen. Some of the communal houses are two to three stories high and contain from 1,000 to 2,000 rooms, with underground council chambers. Excavations have brought to light many priceless relics. The cliff or cave dwellings are to be found in the perpendicular faces of cliffs, usually those facing the south. They are most numerous in the mesas of the Shufinne, the Puye, the Chupedero, the Alamo,

the Sandia, the Pajarito, and the Frijole. If the cliff dwellings of this district were arranged in a continuous line they would stretch out 60 miles in length. It is estimated that a population of 10,000 might be sheltered in them. Usually the dwellings were excavated many feet above any landing, so that the entrance can be made only by means of ladders. In the higher cliffs, as, for example, those of the Puye, two terraces are found, with from two to four dwellings superimposed one above another.

The chambers are irregular in arrangement, size, and structure. Usually there is a main living room, back of which are from one to two smaller rooms. The walls contain various niches, alcoves, and fireplaces, and in most cases are thickly coated with smoke. Many are plastered with clay on sides and floor, and some have been reenforced with crude masonry. On the mesa above the cliffs, usually occupying the most commanding sites, many ruins of large communal dwellings exist. They are built of cut stone rudely dressed and were doubtless two and, in some cases, three stories high, and built somewhat after the manner of terraced houses of the Pueblo Indians of the present day. On emptying some of the rooms of the débris contained therein it is found that the well-built walls exist in an almost perfect state of preservation to a height of from 5 to 8 feet. The rooms vary from 10 to 14 feet in length and from 5 to 10 feet in width. Fireplaces, doors, and small portholes which served as windows are intact, and the walls, which are plastered with adobe, are well preserved. Several of the communal dwellings are built in the form of a quadrangle and others are irregular in form and contain from 1,000 to 2,000 rooms. The inner court usually contains one or more kivas or estufas—underground chambers—while several more are usually grouped around the outer walls. Defensive outposts occupy usually the valleys below the cliffs, but sometimes the mesas above.

They are built of cut stone and similar in construction to the communal buildings, only smaller. They must have contained originally from 10 to 50 rooms each, were rectangular, circular, or irregular in construction, and are not in as good state of preservation as the smaller ruins. Scattered over the country, usually near the ruins, are numerous circular mounds of stone from 10 to 20 feet in diameter. Contiguous to the stone ruins on the mesa, and also in the face of the cliffs, numerous burial mounds or crypts are to be found. These have, for the most part, been unmolested. In some that have been opened numerous skeletons have been found. Articles in stone, wood, and clay are found in these ruins, as well as remains of charred corn and instruments of copper. The pottery that has been found is, for the most part, well preserved, artistic in form, and ornamental and ancient in pattern. Another important evidence of the culture status of the original occupants of these ruins is found in the pictographs, which are very numerous on the face of the cliffs of the Puye. They consist of etchings in the rock, usually above or near the doorways, but sometimes on the interior walls. The etchings show evidence of very great age. They contain pictures of human figures, as well as animal and conventional designs. Many of these interesting ruins are easily accessible and are well worth a visit, not only by scientists but by everyday tourists.

The southwestern portion of Rio Arriba County is to be included in the Jemez Forest Reserve soon to be established.

SCHOOLS.

Within the past year or two there has been great improvement in the public school system of Rio Arriba County. There are 45 schoolhouses in the county, and 35 male and 15 female school-teachers are given employment, the school term ranging from three to seven months. The total enrollment of pupils is 3,000, while there are 4,000 children of school age. The school revenues amount to $15,000 a year. The Methodists and Presbyterians maintain several missions, and at San Juan and Dulce are Government schools for the Indians.

TOWNS AND SETTLEMENTS.

Tierra Amarilla, Park View, and Chama are treated of under the head of "Cities and towns of New Mexico." Espanola, formerly in Santa Fe County, was by act of the thirty-fifth legislative assembly annexed to Rio Arriba County. The last census gave the precinct a population of 550. The present population is 600. Espanola is a prosperous shipping point for wool, sheep, and farm products. It has several large wholesale houses, a Catholic and Methodist Church, schools, and a weekly newspaper, La Luz.

Chamita is the oldest settlement in the county, in fact in the United States, excepting Santa Fe, having been founded before Jamestown. It is most beautifully located at the confluence of the Chama with the Rio Grande. It is almost as old as the city of Santa Fe and is a prosperous agricultural community on the Denver and Rio Grande Railroad. Its population is 400.

Monero is a coal-mining town with 150 people, situated on the Denver and Rio Grande Railroad, and is also a shipping point for northern Rio Arriba County. There are indications of petroleum and natural gas in the vicinity of the camp.

El Rito is a prosperous agricultural settlement, beautifully situated. Large sheep ranches are in its immediate vicinity. Its population is 600. It has been selected as the site for the territorial reform school.

Abiquiu is one of the oldest towns in the Territory, and that means in the United States. It is picturesquely situated in the Chama Valley and is surrounded by a good agricultural and range country. Population, 500.

Velarde is an agricultural settlement on the Rio Grande, at which a Protestant mission school is maintained.

Embudo is an agricultural settlement picturesquely situated in a small valley on the Rio Grande almost entirely surrounded by high mountains. A mission school is located at this point. The town is about 2 miles from Embudo station, on the Denver and Rio Grande Railroad. Population, 800.

Lumberton is situated on the Denver and Rio Grande Railroad in the center of an extensive timber district. It has a population of 450.

Edith is also a lumbering town, but owing to a dispute over the Colorado boundary it is at present considered in Colorado, although the claim is made that the new boundary survey that is being made by the National Government will place the town in Rio Arriba County. Its population is about 600.

Other settlements at which post-offices are maintained, and at which there are stores, schools, and churches, are Vallecito, Canjilon, Coyote, Rosa, Hopewell, Tusas—these latter two being mining camps—Petaca, Dixon, Truchas, Cordova, Rinconada, Dulce, the agency of the Jicarilla Reservation, Mariana, Alcalde, Gallinas, and Lyden. The following are railroad stations: Coxe, Cresco, Lobato, Willow Creek, Biggs Junction, Azotea, Amargo, Navajo, Encinada, and Brazos.

FUTURE OF RIO ARRIBA COUNTY.

With the Spanish land-grant question settled by the Court of Private Land Claims, Rio Arriba County is attracting many settlers. Its agricultural and irrigation possibilities are being recognized as capable of vast expansion, its mines are certain of development, its timber tracts are but touched in part, and its stock interests offer good chances for investment. The existence of extensive beds of coal, the available supply of raw material for manufactures, the possibility of power development furnished by the many streams, near-by markets, and other advantages should lead to the creation of many prosperous manufacturing industries and the building of new railroad lines within the next decade or two, and a rapid increase in population and wealth.

FINANCIAL STATEMENT OF THE COUNTY OF RIO ARRIBA, N. MEX.

Bonded indebtedness.

Of a series of bonds issued on the 1st day of July, A. D. 1882, there are still unpaid the following bonds, to wit, Nos. 1, 15, 16, 18, and 23, of $1,000 each, $5,000; also an issue of bonds of same date as above of $100 each; there are still unpaid and due now the following bonds, to wit, Nos. 1, 3, 17, 21, 23, 24, and 22, $700.

Above bonds were issued in lieu of old accounts due at the time of the issue for various items, such as salaries and incidental expenses; above bonds bear 8 per cent interest.

Series of 1889, maturing in 1919, or after eight years, at the option of the county, are a series of bonds issued to pay expenses in construction of court-house and jail; there are all the bonds out yet bearing 6 per cent interest per annum from No. 1 to 17, $17,000; also 17 bonds of issue of 1889, of $100 each, 6 per cent interest, $1,700.

Series of 1893, issued January 1, 1893, called current-expense bonds, there are 7 bonds of $1,000 each, bearing 6 per cent interest, $7,000.

Series of 1895, current-expense bonds of $100 each, 6 per cent interest, 10 bonds amounting to $1,000. One bond issued July 1, 1889, for $500.

Series of 1897, a lot of fractional bonds issued in lieu of outstanding warrants and fractional bonds, also for floating debt under the Bateman act, amounting to $6,000, bear 6 per cent interest, and are payable at the option of the county.

All above indebtedness, amounting to $39,000, is all the indebtedness this county has to date, the floating debt shown in our statement of one year having been paid off, and also $1,000 of our bonded debt.

The financial condition of our county is indeed gratifying, the collections having been remarkably good, and we have paid our current expenses the last two years and part of our debt, also the interest on our funded debt; the board of county commissioners have now under advisement a proposition to refund all our bonded debt into bonds of $1,000 each, at 5 per cent interest per annum.

The collections for the last two years amount to $65,000 for all purposes. There was, on the 1st day of January last, in the hands of the treasurer for all purposes in the various county funds $16,052, the collections since that date up to the 1st day of April, 1903, being for all purposes, county and Territorial, $12,000.

The disbursements during the same period, as per report of the treasurer, were $11,000, and for the last two years, up to January 1, 1903, $60,000.

ROOSEVELT COUNTY.

Area, 3,110 square miles. Population, 4,500. The census of 1900 gave this area a population of 353. Assessed valuation, $600,000. County seat, Portales.

Officials.—Commissioners, W. O. Oldham, Robert Hicks, B. Blankenship; probate judge, Charles L. Carter; probate clerk, W. E. Lindsey; superintendent of schools, James C. Llewellyn; sheriff, W. W. Odom; assessor, W. K. Breeding; treasurer, C. O. Leach; surveyor, John A. Fairley.

Newspapers.—The Times, The Herald, Portales.

Post-offices.—Portales, Texico, Floyd, Elida, Bethel.

Roosevelt County, named after the President, was created by the thirty-fifth legislative assembly of New Mexico in the year 1903. It is distinctively a "plains" county and, excepting a fraction out of the southwest corner, is rectangular in form. It measures 64 miles from east to west and 54 miles from north to south, covering 3,110 square miles, or 1,990,380 acres. It is the seventeenth county in size in New Mexico, and yet it covers an area three times the area of the State of Rhode Island. Its western boundary is approximately along the divide or watershed between the Pecos River on the west and the Brazos River on the east. The principal valley crosses the county from a point on the west boundary line north of the center of the county to a point a little south of the center of the eastern boundary line, so that the entire county is traversed in northwesterly-southeasterly direction by a broad valley, which has come to be known as the "Inland Valley." This Inland Valley is therefore about 75 miles in length within the county, and varies in width from 4 to 5 miles to 20 or more miles. It is for a greater part of its length skirted on either side by low hills, and bears all the indications of having been at one time the course of a broad flowing stream of water. There are at intervals along the course of this valley springs, from which flows a constant stream of pure, nonalkaline water. Particularly is this true near the head of the valley, where there are a considerable number of such springs. The course of the drainage for the flow of waters divides at a point a little north and west of the center of the county. The one part forms the head of what is known as the Black Water branch of the Brazos River, and the other forms the headwaters of the Yellow House branch of that stream.

Numerous draws grade into the inland valley at various points along its entire length, coming from various directions and distances, covering the entire county with a network of drainage. These draws and valleys are for the most part broad and the grade from the higher land is so slight that in passing over the surface the descent or the ascent is scarcely noticeable.

To either side of the principal valley and beyond the narrow range of sand bluffs the surface broadens out into the wide plains, upon

which the native grasses grow in abundance, providing excellent pasturage for cattle, sheep, and horses, upon which they feed the year round. From these pastures great numbers of these animals are shipped and driven annually both to the market and to the Northern States for feeding. Because of the mildness of the climate and the abundant growth of grasses, the region embraced within the limits of Roosevelt County is rightly considered a part of nature's breeding ground.

The county is crossed from the northeast to the southwest by the Pecos Valley and Northeastern Railway, a part of the Santa Fe system, operating 70 miles in the county. The Santa Fe system has also surveyed, sectionized, and platted a railroad through the county from east to west, beginning at a point a few miles east of the western boundary line and extending thence in a southeasterly direction down the Inland Valley to near the county seat of Portales, from whence the route extends southeast into the State of Texas, there to join the Gulf branch of the Santa Fe system. The construction of a railway upon this survey will place within the boundary lines of Roosevelt County 130 additional miles of railway, and will make Portales a divisional point for the system. As an evidence of the interest that the Atchison, Topeka and Santa Fe is taking in the county, it may be stated that the company now owns upward of 60 acres of depot, switch, and trackage land within the limits of Portales, the county seat, and that it has recently acquired title to more than 20,000 acres of land, extending in a body from the land about the stock-shipping pens, a strip 2 miles wide, to the Texas-New Mexico boundary line, a distance of 22 miles. Upon this strip of land the railroad company has developed at varying distances stock-watering plants for the accommodation of shippers, and the whole of said land is open and free for the use of those stock owners who choose to drive their herds to the railway to hold them there for buyers, or for the use of those who have shipped at points beyond and desire to unload in transit to feed, water, and rest their stock.

MINERAL RESOURCES.

The assessor of Roosevelt County has upon his rolls for the year 1903 a valuation of real and personal property amounting to $649,164; this notwithstanding that all the property of the Atchison, Topeka and Santa Fe system within the county is as yet exempt from taxation, because the time limit of exemption from taxation after the completion of construction has not yet expired. However, that part of the system within the county that has already been constructed will be liable to taxation in the year 1905. Of the 1,990,380 acres of land in Roosevelt County, not to exceed 226,000 acres have been appropriated or reserved, the area subject to entry under the Federal land laws being 1,035,944 acres, while the remainder is included in public school sections 1 and 16 and other Territorial lands.

During the year ending June 30, 1903, there were entered upon under the homestead act 69,873 acres, under the desert-land act 2,267 acres, and 24,528 acres were taken up as lieu selections.

As late as the year 1900, with the exception of a few cattle, horse, or sheep ranches, long distances apart, the whole region embraced within the limits of the county was unoccupied and unappropriated

Government land. Since the year 1900 there has been a steady inflow of settlers, so that by this time 1,560 quarter sections are occupied by actual settlers who are in the most part engaged in farming without irrigation as a means of earning a livelihood. The year 1900 witnessed the first crude attempts at agriculture without irrigation. Half a dozen farmers in the vicinity of Portales broke small tracts of sod and planted the same to seeds of Indian corn, milo maize, sorghum, and the various kinds of vines. In every instance, and for the most part without cultivation, these experiments resulted in abundant crops. Encouraged by their success a considerable number of farmers engaged in agriculture in the vicinity of Portales during the following year, and in every instance, that year also, their efforts were rewarded beyond expectation. As high as 50 bushels of Indian corn to the acre were produced, while Kaffir corn, milo maize, sorghum, and millet produced heavy crops, and sweet potatoes, pumpkins, and all kinds of melons grew in profusion. There were men who settled in the vicinity of Portales in the year 1900, making homestead entry on their lands, moving their families into half dugouts but with one room, who were without means or property except a team, wagon, and plow, and who engaged in nothing else but farming part of their 160 acres, who have made enough to fence their lands, build comfortable and roomy houses above ground, build sheds for their cattle and storehouses for their grain, and have lived comfortably at the same time. It would seem to be only a question of industry and good management.

During the past year a great many families have come in who have property and money, and who have gone about the work of farming and improving their homes, using good teams and modern implements and machinery, and the prospects for a good crop this year are exceptionally flattering. Large orchards have been planted and fields sown to alfalfa, and those who have this year sown their lands to oats are at this writing cutting a good crop.

POSSIBILITIES OF IRRIGATION.

While many a settler in Roosevelt County who sought to insure himself against drought by drilling wells and erecting windmills has regretted his expenditure of money because he thus far has not needed them, yet, should at any time irrigation be deemed necessary, there is throughout the Inland Valley, in Roosevelt County, an inexhaustible supply of water, from surface springs to an underground flow, at a depth of 100 feet. This makes a convenient supply of good water, that has been pronounced by experts to be more cheaply available for irrigation in small systems than could be otherwise obtained. The water can be raised to the surface by means of pumping engines at a comparatively small cost. This would also enable the land to be subjected to intense cultivation. No tests have yet been made for an artesian flow within the limits of the county, but it is believed that a flow can be secured at a moderate depth. An association has been formed and a fund raised and contract made for the drilling of an experimental well.

The people who have settled in Roosevelt County are for the most part from the plains of Texas and from Oklahoma. Those who have taken up Government land have done so with the assurance that they will be able to produce crops upon the land without irrigation. They say

that the rainfall is not less, that the climate is not more severe, and that, as a rule, the soil is better adapted for the production of crops than the lands of those sections from which they have come. The soil of Roosevelt County is for the most part a sandy loam, underlying which is a clay subsoil. The soil retains moisture and resists the effects of the drought to a remarkable degree.

The western range of townships lies in such proximity to the Pecos River Valley that a considerable body of land in that vicinity has been temporarily reserved under the provisions of the national irrigation law, pending a survey to determine the feasibility of building an irrigation plant. From a casual view of the situation it seems evident that nature especially intended that section for a natural reservoir site. There is a large natural reservoir into which the flood waters of the Pecos can be led at a minimum cost, and from this storage reservoir by a system of canals and ditches a large tract of level fertile land can be brought under irrigation and cultivation.

FRUIT GROWING.

There is every indication that horticulture will become a profitable industry in Roosevelt County. Such fruit-bearing trees as have reached a bearing age at the older ranches have produced abundant fruit of an unsurpassed quality. The elevation retards too early blossoming in the spring, while the sunshine and soil conduce to the highest development of flavor, form, and color. During the past two or three years the business of the fruit-tree agent about Portales has been active. Almost every homesteader has planted an orchard, while many thousands of forest, ornamental, and shade trees have been planted. Fruit, forest, and ornamental trees make a satisfactory growth, and when the soil is properly prepared before setting and afterwards kept in good state of cultivation the growth of trees is surprisingly rapid. A peach orchard at the headquarters of the "H" ranch, 2 miles west of Portales, bore a heavy crop of peaches in the years 1900, 1901, and 1902. All kinds of small fruits do well, especially gooseberries, blackberries, and grapes; also all varieties of plum and cherry trees make a remarkable growth.

CLIMATE.

The climatic conditions which exist in Roosevelt County are exceptionally favorable to those afflicted with pulmonary, catarrhal, or asthmatic troubles, and the elevation is sufficiently great to make epidemics of enteric diseases and malaria out of the question. During the summer season there is a constant breeze, and thus far no hot winds have been experienced. From June to January the climatic conditions are ideal. After January there is an occasional sand storm and high winds. Snow seldom lies longer on the ground than three days.

COUNTY ORGANIZATION.

Acting in accordance with the provisions of the bill creating Roosevelt County, the governor of the Territory on March 31, 1903, appointed the county officials, who, immediately after qualifying, set to work organizing the county. The board of county commissioners

has divided the county into four precincts, and ten school districts have been created. The county begins its existence with a bonded indebtedness of only $3,000, its share of the indebtedness of the county of Chaves, from which it was established. The matter of erecting a court-house and jail on the public square at the county seat will soon be taken up by the board of county commissioners. Several good offers have been received by those who desire to buy bonds issued by the county for that purpose. The tax levy for county purposes for the year 1903 is lower than was the tax rate of Chaves County, from which Roosevelt County was formed, for the year 1902, despite the expense incident to the organization and the low assessment of the new county.

POPULATION.

The population of the area embraced in the county of Roosevelt, according to the census of 1900, was 353. The special census for precinct No. 1, Portales, taken in August, 1902, gave the precinct a population of 1,928. At the present time the population of the county is conservatively estimated at not less than 4,500 people. Practically all of these people have come from the States and Oklahoma. They are intelligent, lawabiding, and industrious, as well as liberal in their views.

TOWNS AND SETTLEMENTS.

A description of Portales, the county seat, is given under the heading of "Cities and towns of New Mexico."

The town of Elida is situated near the southwestern boundary of the county. It is 25 miles from the county seat, and is a station on the Pecos Valley and Northeastern Railway. The land in the neighborhood of Elida is rolling prairie and covered with a luxuriant growth of mesquite and gramma grass, and upon the sandier land a tall sedge grass. During the past year filings have been made by homesteaders upon the surrounding lands. Houses are to be seen in every direction and fields have been sown to various kinds of crops. The prospects are good for further development and growth. A town site has been laid out. It covers 80 acres. A square is dedicated to the public. A public well, pumping plant, and reservoir, and a block for a public school building are included in this public square. Elida has a post-office, a general merchandise store, a hardware store, a large lumber yard, a grain and feed store, a restaurant, a saloon, a blacksmith shop, and a carpenter shop. In the town and immediate vicinity there is a population of 600 people. Beyond the present settlement and in every direction there are fine lands subject to entry under the homestead act and also good coal indications.

The town of Texico is at the point where the Pecos Valley and Northeastern Railway crosses the New Mexico-Texas boundary line. The town site was surveyed and platted in August, 1902; it is 22 miles from Portales. The land upon which the town is located is for the most part level. The growth and advancement of this town and settlement has been astonishingly rapid. More than 100 quarter sections of land in the immediate vicinity have been occupied by actual settlers. The soil in the vicinity of Texico is deep sandy loam, easy of cultivation and very productive. The New Mexico Eastern Rail-

way survey forms a junction at this point with the Pecos Valley and Northeastern Railway, and surveys have been made out of Texico for railroad purposes eastward to Floydada and Quanah, Tex. There are already at Texico 18 business houses, and the population of the town and immediate vicinity is not less than 500. A school house has been built, and the school census shows 95 children of school age. Crops in the vicinity of Texico this year are in excellent condition and bid fair to make good returns for labor and time expended.

At Bethel, which is 9 miles from Portales, a post-office has been established. A school is maintained here by the Christian Church, which has erected buildings at this point for the accommodation of students. The land in the vicinity of Bethel for several miles in every direction has been entered under the homestead act, and is being occupied and cultivated by actual settlers.

Nine miles west of Bethel is the settlement and post-office of Floyd. Floyd has a general store and a neat school building only recently completed. Practically every quarter section of land for several miles around this settlement has been taken up and is occupied and under cultivation by homestead entrymen.

SANDOVAL COUNTY.

Area, 3,959 square miles. Population, 12,500. Assessed valuation, $792,565. County seat, Sandoval.

Officials.—Commissioners, E. A. Miera, E. Baca, I. Gutierrez; probate judge, Nicolas de la O; probate clerk, O. P. Hovey; sheriff, Fred. J. Otero; assessor, M. Baca; treasurer, V. S. Miera; superintendent of schools, J. B. Archuleta.

Post-offices.—Algodones, Bernalillo, Bland, Cabezon, Casa Salazar, Cuba, Jemez, Miller, Pena Blanca, Perea, Placitas, Sandoval, Senorito, Sulphur, Thornton.

Sandoval County was created by an act of the thirty-fifth legislative assembly in 1903, Bernalillo County contributing the largest area to the county and Santa Fe County the precinct of Moriarty. Of its area of 2,534,050 acres, one-half is still subject to entry under the Federal land laws, while a considerable portion of the remainder is included in so-called private land grants. During the fiscal year ending June 30, 1903, there were taken up under the Federal land laws 2,477.08 acres in the area covered by the county. The Rio Grande River cuts through its southeastern corner. The Puerco River rises in the county. Next to the Rio Grande and the Puerco the Jemez is the principal stream. The Galisteo, the Frijole, the Uno de Gato, and the San Pedro are other streams in the county.

The main range of the Rocky Mountains, here called the Jemez and the Cochiti ranges, and the Continental Divide penetrate into the county, some of the peaks rising to an elevation of 13,000 feet. These mountains are cut by deep gulches and canyons. In the southeastern part of the county is the massive and picturesque Sandia Range.

Sandoval County is the thirteenth in size among the twenty-four counties of the Territory, covering an area almost four times as great as does the State of Rhode Island. Its population is estimated at 12,500.

INDUSTRIES.

The principal industries are stock raising, farming, fruit growing, and mining. Its central location, great diversity of topography, and fine climate, together with the fact that the famous lower Rio Grande Valley starts in the county and extends through it for more than 20 miles, give Sandoval County especial prominence and attractiveness. There are in the county nearly 500,000 acres that can be made subject to irrigation and about 1,500,000 acres are considered excellent pasture. The mesas or table-lands are usually long stretches of plain, varying in width from 5 to 20 miles, and extending from the base of the mountains in the direction of the valley, with an inclination of only a few feet to the mile, and ending abruptly in a range of bluffs or sand hills, which form a background of brown for the verdure of the valley. These mesas are the principal grazing districts. In seasons of average rainfall the grass grows abundantly, and, owing to its

peculiar character, it "cures" on the ground during the fall, and instead of "washing out" and becoming valueless like the ordinary prairie grass, it is like hay, and makes almost as good feed in the winter as in the summer. These plains are dotted at all times of the year with herds of cattle and flocks of sheep. During the summer and fall the animals have to be "held" comparatively near the springs or water holes, because cattle have to range where they can go to water during the warm weather once a day and sheep at least once in two days, but after the weather gets cool and a little snow falls on the grass the animals, especially the sheep, can go a little longer time without drinking, and that gives them practically a fresh field in the winter.

THE IRRIGATION SYSTEMS.

The Rio Grande Valley is here broad and fertile, producing, under irrigation, of course, almost any crop indigenous to the Temperate Zone. The irrigation canals as yet still possess much of their original crudeness. There has never been a complete survey of the ditches or lands under them, and there are but few maps or records of any description in relation thereto. The total amount of land, however, under ditch is approximately 10,000 acres, of which 3,000 acres are under cultivation. Of the balance 1,800 are in swamp and meadow ands from the waste of water in irrigation from the ditches, while the remainder is uncultivated, not from any lack of water or other natural cause, however. By the construction of storage reservoirs in the mountain canyons to catch the storm waters which come down in great volumes during the rainy season, in July and August, and to conserve the waters of the small streams, thousands of acres of this valley land, as well as a large proportion of the mesa land, can be rendered arable and made to produce good crops.

One-half mile above the Pueblo Indian village of San Felipe, on the Rio Grande, is a fine natural reservoir site. The elevation of the site is from 5,130 to 5,170 feet above sea level. It covers 1,511 acres. Of this area but 200 acres are under ditch and cultivation, the balance being a valueless sandy waste. The entire site is on the San Felipe Indian Reservation. The improvements on the site consist of the cultivated lands mentioned and the tracks of the Atchison, Topeka and Santa Fe Railway on the east side of the river. The dam site is 1,600 feet long to the west of the butte, with about 750 feet in addition required to the east, where the spillway should be placed. The capacity of the reservoir would be 26,743 acre-feet.

At the Cochiti pueblo the Government has completed irrigation works by cutting an irrigation canal through a bluff. This relieves a chronic shortage of water for irrigation at this village. The soil is unusually strong, especially in the mineral elements, being composed almost wholly of detritus from the neighboring mountains and lacking only the addition of a very little animal or vegetable matter now and then to keep it rich indefinitely. A company incorporated under the laws of the Territory had started the construction of a canal, starting at Algodones, which will have a length of about 40 miles, covering the most populous portion of the valley, in Sandoval and Bernalillo counties, and it is believed that its construction will render practicable the cultivation of all the land within that distance, whereas at present only about one-third of it can be cultivated. This will make places

for a large number of new settlers and will do much for the development of that portion of the Rio Grande Valley in question, which is one of the most desirable sections of the Territory, and one in which the farmers and gardeners are never without a good home market for all of their products.

There are a few places in the county where private reservoirs have been constructed, and are found to be successful in the irrigation of small tracts, but no work of this character on a large scale has yet been completed. There is also some farming done in the canyons, though in a very small way, the principal crops being potatoes, beans, and chili, and some wheat and oats. The mountain sides, when not too steep or broken, are found to be excellent fruit lands, and the yield is more certain there than in the valleys, because less liable to injury from late frosts in the spring. Apples, especially the winter varieties, do better in the mountains than elsewhere, and it is believed by many that fruit growing on the mountain slopes will become in time a very important industry. In some of the mountain districts the rainfall during the growing season is sufficient to produce crops without irrigation.

FARM AND ORCHARD PRODUCTS.

It is not claimed that this section can compete with the great grain growing States of the West in the production of such field crops as wheat and corn, and it would not be wise from a business standpoint for the owners of the land to devote it to such a purpose, because it can be made to yield so much better returns when given to other crops. The true policy here is to have small farms closely cultivated, and yielding as land can only be made to yield under irrigation. In the wheat and corn growing States a man is supposed to need 160 acres to make a profitable farm, but a much smaller area is required here. It has been asserted that 10 acres of the valley land of this county, cultivated under irrigation, could be made to bring the owner a larger net cash return every year than could be realized from a quarter section in any of the grain-growing States. A farmer of twenty years' experience writes in support of this opinion as follows:

Sweet potatoes of most excellent quality yield abundantly in the soil of this valley and do not require to be irrigated as often as most other crops, thus saving the farmer much labor. Both soil and climate seem to be peculiarly adapted to their growth, and the quality of the product is fully equal to the famous sweet potatoes of New Jersey, while a fair average crop will give from 900 to 1,000 bushels to the acre. They never sell in the fall for less than $1 per bushel, and those that are kept into the winter usually bring as much as $2. From this it will be seen that 1 acre cultivated in sweet potatoes in Bernalillo County will bring the farmer as much money as he could hope to realize from 80 acres in corn or wheat in any of the grain growing States in a good year, and since the result is to be measured by dollars and not by acres it will be seen that the irrigation farmer, although he may not be able to cultivate fields as broad as those of his neighbor in the rain belt, has a better chance of success and a decidedly better prospect of a balance to his credit in the bank at the end of the year. The onion is another product that seems to be peculiarly adapted to this section of the country. The large white Spanish onions, which grow to greater perfection in New Mexico than anywhere else in the United States, afford one of the most profitable crops that can be grown in this county, and is also one that can be brought to perfection only under irrigation.

On account of its beautiful silvery color and its peculiar mild flavor this onion finds ready sale in any part of the country, and always commands the highest price. The yield is about 200 bushels to the acre, bringing $3 a bushel in the winter and spring. Celery and asparagus are also articles which are especially adapted to the soil and

climate of this county, and attain here a degree of excellence but rarely found in such articles grown elsewhere. The celery is far superior to that grown in California, and is pronounced by all who try it fully as good in all respects as the Kalamazoo product. Nowhere else on the American continent is there produced asparagus which can at all compare with that grown in the valley of the Rio Grande. In many places in the valley there are large quantities of a salt which goes under the common name of "alkali," and which, though deleterious to some kinds of vegetables, is one of the favorite foods of asparagus and does away with the necessity of applying salt to the ground, as is the custom wherever asparagus is grown in the Eastern or Middle States. It also causes the plant to attain in this section a degree of excellence in tenderness and flavor which is unknown in that grown elsewhere. During April and May, the months when the cutting is done, the shoots will attain, under favorable conditions, a growth of about 6 inches a day, every particle of which is edible; there is no woody portion to be thrown away; the whole stock is soft and tender, and the flavor is proportionately superior. The whole country is open for a market, and that such an article can be sold wherever introduced goes without saying, for it sells itself. An asparagus bed of 1 acre will yield after the third year about 200 pounds a day for sixty days in the year (which is as long as it is wise to cut it), and this will bring an average price of 10 cents a pound.

Thus with 1 acre of sweet potatoes, celery, onions, and asparagus a man can make a good estimate of the money value of the crop that he will have for market each year. And in addition to this he will need 2 acres in alfalfa, and 2 in corn or oats for his cow and horse, and 2 for house and lot, orchard, and kitchen garden. That makes 10 acres in all, and is as much land as any man needs in this section to farm for profit, while it is as much as the most industrious man can properly cultivate in the crops named. There is an abundance of good land for such purposes to be had in this county at fair prices, and with good facilities for irrigating, such as are now being provided, there will be room in this line of business for at least a thousand families, convenient to as good a market as there is anywhere in the West.

Alfalfa is becoming more and more a general crop in the valley each year; also early melons. Corn, oats, barley, and rye do well. Considerable attention is given to fruit growing, but the grape crop is to-day, and will likely always be, the principal fruit crop. The valley is peculiarly adapted to grape cultivation, and this fruit raised now successfully competes with the California product in any market to which it has been introduced. The grape most generally cultivated is that known as the "Mission" variety, supposed to have been introduced by the Franciscan friars and cultivated in this valley in the past two centuries. Some small vineyards of the muscatel and other choice table varieties are also found. The country round about Bernalillo is one vast garden, famous for its fruits, and the wine industry here is an important item.

The blooming fields of the Rio Grande stretching out toward the south with the picturesque Sandia Mountains for a background make this region ever an interesting landscape study. Bernalillo has a population of 800, and as many more people are clustered about it, engaged chiefly in horticulture and agriculture. Not far distant is the thrifty Algodones section, noted for its hay, grain, and fruit products, and also for its coal fields, mineral wealth, and promising petroleum indications.

The principal tributaries of the Rio Grande in this county lead in from the west—the Jemez and the Rio Puerco, the latter rising in the county, but flowing into the Rio Grande in Valencia County. The former merges from a mountainous section, the inhabitants of which depend upon agriculture and mining for a livelihood. A part of the Rio Puerco Valley is under cultivation, and here 50,000 acres of fertile land could be easily watered for colonization purposes. It would make an ideal spot for locating a sugar-beet colony.

MINERAL RESOURCES.

The most important gold-mining camp is at Bland, in the northeastern section, reached from Thornton by stage line and from Santa Fe by a good wagon road. The town is the center of the Cochiti mining district. It is situated at the head of Pino Canyon, about 10 miles west of the Rio Grande, where it forms a broad and fertile valley west of the agricultural region about Pena Blanca. The population of Bland and the adjacent camp of Albemarle is about 200. Mining, milling, freighting, and the lumber industry chiefly occupy the attention of the people of Bland and vicinity. All the mercantile lines of business are well represented. The Methodists have a good church building.

The value of the mammoth gold-bearing quartz ledges in the Cochiti district has been demonstrated beyond any doubt. The mineral belt so far as opened is about 6 by 7 miles in extent, and the region is ribbed with parallel veins of quartz varying in width from 5 to 60 feet, uniformly carrying values. Several of these ledges have already been extensively developed, and practically all the ore that has been taken out yielded a handsome profit at the cyanide mills on the ground. The Albemarle property has been opened to a depth of 800 feet. In the Star mine enough ore is in sight to run a 100-stamp mill day and night for a long period. A similar showing is made in the Iron King. The Washington, Grant, Crown Point, Black Girl, Little Mollie, and a score of other developed properties all show immense bodies of low-grade ore mixed with a generous proportion of high-grade ore running $40 in gold and upward. Two mills have been in operation in the district, the Albemarle and the Woodbury, while two more mills are planned. It is found that by a combination of the cyanide and Pelton-Clerici methods the Albemarle mill treated 9,000 tons of ore per month.

The pay roll of the Cochiti Gold Mining Company at one time was $14,000 a month. The Lone Star people have a small 20-ton plant and will construct a mill with a capacity for treating 350 tons daily. The Star Mine is down 900 feet. The district has produced about $2,000 in gold bullion daily, and new ore discoveries are reported frequently.

The nearest railway point is at Thornton, on the main line of the Atchison, Topeka and Santa Fe, about 18 miles distant, but a stage line furnishes comfortable transportation for passengers and a daily mail. The same coaches continue up the canyon from Bland and across the mountain to the Sulphurs, San Antonio, and Jemez Springs, well-known health resorts, the waters of which have been found to possess valuable medicinal qualities. A railroad line from near Thornton to this camp has been surveyed and a company has been incorporated to build it. Its construction will infuse new life into the camp, which has been rather quiet of late. There are several other mining camps in the county, though the most of them have so far been unable to send much ore to the market owing to the undeveloped state of their mines.

At Nacimiento and Algodones are rich leads of copper which lack only development to make them good and profitable metal producers. Indications of oil and immense coal beds exist and are being developed near Algodones, and a model town site has been laid out. A well-drilling outfit has been put to work drilling for oil near Algodones, and is down several hundred feet.

Not far from Algodones, and to be connected with it soon by the Santa Fe Central Railway, are the Hagan, Coyote, and Pino Vititas

coal fields, which are being extensively developed by the New Mexico Fuel and Iron Company. Here there are 46 square miles of coal, six workable seams, one above the other and with gentle slope, so that with one stope several seams can be worked. These seams come to the surface along steep bluffs and are plainly visible for a length of 13 miles. Many stopes have been driven into this bluff; the principal one at Hagan or Uno de Gato. The diamond drill has also proved the extent of this immense coal field. The coal is a good quality of bituminous coal. At Hagan a coal camp has sprung up, and at Uno de Gato a town site has been laid out amidst picturesque surroundings and supplied with good water. The mountains round about are rich in gold, lead, copper, iron, and gypsum, while in the foothills is plenty of timber.

SUMMER RESORTS.

Some of the most delightful summer resorts in the Southwest are located in the mountains. The Jemez Hot Springs, now well known and popular as a health and pleasure resort, are in the canyon of the Jemez River, easily reached either from Albuquerque or Santa Fe. Albuquerque and the Sulphur Springs, as well as the San Antonio Springs, are situated in the same section. All these places are well-known resorts, and their reputation extends beyond the limits of the Territory. They are visited annually by many persons in search of health, and the waters have a very salutary effect in nearly all cases. Good fishing, large and small game, and magnificent scenery are attractions of that section. At Sulphurs a mill has been built to treat the sulphur deposits, which are very extensive.

There are other attractions that Sandoval County offers to the tourist, including the cliff dwellings in the region bordering on Santa Fe County, which are very interesting, and the Indian pueblos, of which Sandoval County has more than any other county in the Territory. The largest is Santo Domingo, with a population of 772 people. The other pueblos in the county are San Felipe, with 516 people; Jemez, 455; Cochiti, 295; Santa Ana, 228; Zia, 116, and Sandia, 86. They are all interesting spots to visit. They manufacture pottery, beadwork, and baskets, and their periodical dances and festivals are of great interest.

RAILROADS.

Sandoval County has good railroad facilities. The Santa Fe system cuts through the southeastern part of the county for about 40 miles. The Santa Fe Central Railway has about 20 miles in the county, and after the construction of its surveyed branch into the Hagan coal fields and Algodones and from there across the Rio Grande River to Durango, Colo., will have over 150 more miles in the county. The building of the surveyed railway line from near Thornton to Bland will add another 18 miles. The county has many good wagon roads. Several stage lines offer facilities to reach the settlements distant from the railway lines.

Sandoval County's future lies in its extensive coal beds and the reclamation of part of its area by storage reservoirs, which is destined to make it the garden spot of New Mexico. Its climate, while it possesses the general characteristics of that of New Mexico, is milder in

winter than the more northern counties, and, owing to its lower altitude, the county is a sanitarium for those health seekers who can not bear the more severe winters and the greater altitude of the northern counties. During the summer months the near-by city of Santa Fe and the mountain resorts offer a refuge from the heat, which, however, is at no time as oppressive as in the more humid East. It is only during the noon and afternoon hours in July and August that the maximum temperature at times reaches 100°, while the minimum during the night is very seldom over 65°, which seems 10° to 20° lower than it would be in a more humid climate.

SETTLEMENTS.

A description of Bernalillo is given under the head of "Cities and towns of New Mexico."

Sandoval is the county seat and will soon have a court-house and jail. Thornton is quite a commercial center. At Algodones a town site has been laid out, and after the building of the Santa Fe Central Railway from Hagan to Algodones, where it will form a junction with the Atchison, Topeka and Santa Fe Railway, it will become quite a bustling railway center.

Corrales and Huertas are settlements in the Rio Grande Valley, and La Madera and San Antonito are rural settlements picturesquely situated in the foothills of the Sandia Mountains.

Moriarty is a railroad point at the junction of the Santa Fe Central and the Albuquerque Eastern Railway. Around it are several good sheep and other ranches, provided with water from wells.

SAN JUAN COUNTY.

Area, 5,598 square miles. Population, 6,500 (4,828 according to census of 1900). Assessed valuation, $679,491. County seat, Aztec.

Officials.—Commissioners, J. V. Lujan, J. R. Williams, J. E. McCarty; probate judge, M. Garcia; probate clerk, J. Prewitt; sheriff, J. E. Elmer; assessor, B. C. Vaughan; treasurer, A. G. Black; superintendent of schools, O. C. McEwen; surveyor, Charles Holley.

Newspapers.—The Aztec Index, Aztec; The Farmington Hustler-Times, Farmington.

Post-offices.—Aztec, Farmington, Putnam, La Boca, Blanco, Bloomfield, Cedarhill, Floravista, Fruitland, Hood, Jewett, Laplata, Largo, Olio, Crozier.

San Juan County occupies the northwestern corner of the Territory of New Mexico. It is bounded on the north by La Plata County, Colo.; on the west by Arizona; on the south by McKinley County, and on the east by Rio Arriba County. The Government monument, which marks its northwestern corner, also marks the corners of New Mexico, Arizona, Utah, and Colorado. It is adjacent to one of the richest mining fields in the United States, and its present distributing point is Durango, just over the Colorado line.

AREA.

San Juan County is an empire in itself. It covers 5,742 square miles, or, to be more exact, 3,697,000 acres; of which 1,958,400 acres are included in the Navaho Indian Reservation; 1,473,000 acres are still subject to entry under the Federal land laws; about 260,000 acres have been appropriated, and about 300,000 acres are irrigable. During the fiscal year ending June 30, 1903, 2,040 acres were entered, 1,960 of them under the homestead act. The county is four and one-half times as large as the State of Rhode Island; three times as large as Delaware, and it contains 900 square miles more than the State of Connecticut.

TOPOGRAPHY.

Topographically, the county, or at least the irrigable portion of it, viewed from above, presents the appearance of a basin surrounded on all sides with mountains and high ridges, with a deep notch cut into one side, through which the San Juan River flows. The county is not mountainous, but is located in the foothills, on the mesas, and in the valleys of the gigantic mountain masses to the north in Colorado. Some of its hills, however, rise to a considerable altitude. Outside of the river valleys and the upper mesas, which are broad and level, the county consists of a series of double lands broken by arroyos and generally composed of fertile soil, upon which the native grasses grow luxuriantly.

The altitude of the county ranges from 5,100 to 5,800 feet. On the La Plata, in the La Plata Valley, extending to the San Juan River,

is a large body of land called "The Meadows," consisting of about 30,000 acres of unbroken land, which slopes gently from both sides to a dry run or arroyo in the center. It is 5 miles wide in some places, and it is situated just right for irrigation purposes. A man could readily irrigate 100 acres of this land without assistance if water were convenient. The soil is very deep and productive, in fact, it is especially adapted for the raising of grain, fruit, alfalfa, and vegetables. The tract has the appearance of a prairie or of an old field all ready for the plow. The land is subject to entry under the homestead and desert-land laws of the United States, and, if reclaimed by the construction of irrigation works, would support from 800 to 1,200 families. At the head of "The Meadows" is a natural reservoir site, which could be made to supply sufficient water for this entire tract. The reservoir would also make a beautiful lake for fishing, boating, and other attractions of a summer and winter resort.

RIVERS AND IRRIGATION.

The annual rainfall in San Juan County amounts to about 14 inches, and the county is consequently arid, the rainfall not being sufficient to raise crops. The county's greatest wealth, therefore, is its abundant water supply, which, according to John B. Harper, irrigation engineer of the Pueblo Indians, is greater than that of the rest of New Mexico. This water supply is drawn from the stupendous mountain masses of southwestern Colorado. The county is drained almost entirely by the San Juan River and its tributaries, whose waters find their way to the Pacific Ocean through the Colorado River. The San Juan drains the vast watershed of the eastern side of the Continental Divide and traverses the entire length of the county from east to west. Rising in the same mountain masses in Colorado and drai ing their southern slopes are the Pine, Las Animas, and La Plata rivers, which flow into the San Juan and afford an abundant supply of water for irrigation purposes. The perpetual snow in the Colorado Mountains supplies these streams with cold, pure water even when every other part of the arid regions is suffering from drought. The San Juan River enters the county just below its junction with the Piedras, a short distance south of Arboles, Colo., and thence turning toward the west passes out near the northwestern corner. Its water supply comes entirely from the watershed to the north, as the drainage from the south is small and uncertain. The length of the river in the county is 124 miles. It is 275 feet wide on the average and has a fall of 11 feet to the mile. In the spring and early summer it is not fordable, and when at low water it is from 2 to 4 feet deep, with a tremendous underflow. The least flow of the river is about 4,000 cubic feet per second, or sufficient to irrigate 640,000 acres. At the settlement of Largo the river bottoms widen into rolling mesas and bottom lands available for cultivation. Here the most important tracts are known as the Bloomfield and Solomon mesas, and, with the lower valleys, aggregate about 20,000 acres on the north side of the river; thence to the junction with the Animas River, a distance of 10 miles, the lands are broken and difficult to irrigate.

On the north side of the river, between the mouth of the Animas and Jewett, is a splendid piece of valley land 25 miles long and 1 or 2 miles in width. The Animas and La Plata rivers empty into the San

Juan near Farmington, about midway in the county. The flow of the Rio de los Pinos at its junction with the San Juan is 80 second-feet. The Las Animas is the largest tributary of the San Juan, and its mean flow is 855 second-feet below Aztec. The La Plata River enters the San Juan about 3 miles below Farmington, and its mean flow is 50 second-feet. These streams are all permanent in character, but the flow fluctuates with the seasons, depending primarily upon the melting of winter snows in spring and upon the so-called rainy season, occurring usually in the latter part of August and in September. The spring flow usually begins in the early part of March and reaches its maximum about the middle of May, thence gradually declining until the fore part of July, when it reaches the normal summer flow. The rainy season flow, occurring in August and September, is characterized by sudden freshets which are at times of great volume, as in September, 1896, when a flow of 7,800 second-feet was observed in the Animas River.

Some portions of the county along the rivers have been settled for about twenty-five years, but until about ten years ago the settlement was very sparse, with small trading posts along the most traveled roads. The farmers have joined in constructing canals and ditches sufficient to irrigate nearly all of the tillable land in the first or immediate bottoms of the rivers, and also some of the mesa lands on the second bottoms. While the various ditches and canals under the law are called corporation or community ditches, they are owned exclusively by the farmers and landowners having land under them. In the first construction of these ditches or canals the farmers owning adjoining land would associate themselves as a community ditch company to construct a ditch with sufficient capacity to irrigate all of their respective lands under this particular ditch. The shares of water were then divided among themselves in proportion to the amount of land that each held for irrigation. Each farmer thus procured a sufficient water right for the lands owned by him under this particular ditch. This water right goes with the land and is perpetual, the same as houses, fencing, and other improvements on the land. Of course water rights can be divided, transferred, and sold separately from the land, or attached to other lands by deed or transfer.

The only expense connected with a water right in one of these community ditches is the amount of work and expense necessary each year in repairing and putting the ditches in proper shape. This expense is light and is done mostly in work of cleaning out and repairing the ditches, each water owner doing his pro rata share of the work. The average cost of a water right for 40 acres ranges from $10 to $25.

There is but one syndicate or real corporation ditch in San Juan County, and that is known as "The Animas, La Plata and San Juan Canal," or the Coolidge ditch, owned and controlled by Dr. John W. Coolidge, Judge Albert Hand, and other associates, with headquarters at Scranton, Pa. This canal is 20 miles long, and about $100,000 was expended in its construction and acquiring lands under it. Outside of this canal the 80 other ditches and canals in San Juan County are owned and controlled by the farmers and landowners having land under irrigation, and there are no water rents or water taxes levied by these community ditches.

The irrigable areas are found on the table and bottom lands of the San Juan, Las Animas, and La Plata rivers. In addition, and prop-

erly to be considered in the San Juan basin, are the lands on either side of the Largo, Canyon Blanco, and Canyon Gallegos, which flow into the San Juan from the south, but are dry part of the year. Still farther south are 24 townships supplied with water, but less abundantly, from the headwaters of the Rio Chaco or Chusca and the Ojo Amarilla.

The Animas Valley, through which flows the Rio de las Animas, a beautiful stream from 150 to 200 feet in width, with a minimum flow 2,000 cubic feet per second, is a very fertile valley from 1 to 3 miles in width, and extending from the Colorado line on the north to a junction with the San Juan, a distance of 40 miles. Nearly all of the lands in this valley are under irrigation, and the entire 40 miles is dotted with beautiful homes and thriving villages. Between the Animas and La Plata rivers lies the attractive Farmington Glade, several miles in width by 18 miles long, covering 25,000 acres of land. By a high line ditch water from the Animas River could be carried to this body of land, and it offers a particularly inviting field to those in search of irrigation enterprises. A peculiarity of the Animas River is that the bottom is composed of small, round, waterworn bowlders that exist to an unknown depth. More water flows in the bowlder bed than appears on the surface. The La Plata is about 40 feet in width.

There are in actual cultivation under the 20 ditches on the Las Animas 5,000 acres; under the 20 on the La Plata 4,200 acres, and under the 20 on the San Juan 5,000 acres; while on the Rio de los Pinos about 500 acres are under cultivation, making a total of about 15,000 acres under actual cultivation on these streams. The total land under ditch is in the neighborhood of 100,000 acres, that portion not in actual cultivation being used for pasturage; of this 50,000 acres could be put under cultivation without necessitating any enlargement of the present irrigation system.

Work is being prosecuted on the construction of a 35-foot canal to cross the Fivemile Mesa to bring water to the Navaho Indian Reservation. The work is being done by the Government.

Several companies and syndicates are figuring on the construction of a number of new ditch and canal enterprises in the county that will bring under irrigation and cultivation large bodies of rich Government lands subject to homestead and desert-land entries. Not one-fifth of the rich, fertile land of San Juan County that can be reclaimed by the building of new canals and ditches or storage reservoirs has yet been filed upon. In the western part of the county, tributary to the La Plata Valley, several large storage reservoirs are now in contemplation, which will water large bodies of uplands and mesas that are now Government land. The acreage adapted to agriculture, but not yet under ditch, is 500,000 acres. The greater part of this can be reclaimed, as the water supply is abundant. On several ranches windmills have been erected, as abundant water is found at small depth, and at a greater depth artesian water could probably be developed.

There are large bodies of Government land on the upper mesas and on the divides in various parts of the county that are adapted for agriculture and can be irrigated by the great amount of water that flows to waste every year. In the La Plata Valley, along the La Plata River, in the western portion of the county, there is a vast area of tillable land that can be irrigated cheaply if storage reservoirs are

built to store the flood waters flowing to waste down the river. The La Plata River, being the shortest river of the three principal streams in the county, with the smallest drainage area. Having its sources in the La Plata Mountains, west of Durango, Colo., the supply of water in the river sometimes does not last to the latter part of the irrigating season, because the La Plata Mountains are not very high and the snow on them melts quickly, especially if the snowfall of the preceding winter is light. Consequently the uplands and higher mesas have not always sufficient water later in the season, but through utilizing the natural sites for reservoirs enough water can be stored during the flood season to supply any shortness of water later in the season.

The thirty-fifth legislative assembly in 1903, by resolution and memorial to the Department of the Interior, indorsed and recommended resolutions adopted by the Territorial irrigation commission asking that preliminary surveys and examinations of the condition of the water courses of San Juan County be made by the Government, and that a sufficient appropriation be set aside from the public irrigation fund to build storage reservoirs in the La Plata Valley, in western San Juan County, to store the flood waters of the La Plata River for the irrigation of large tracts of productive lands. The legislative assembly also recommended to the President of the United States and the Secretary of the Interior the making of preliminary surveys to investigate the conditions referred to by the Territorial irrigation commission and to appropriate sufficient money for the construction of these reservoirs. In compliance with these recommendations, the Secretary of the Interior has already directed that these preliminary surveys and examinations be made, preparatory to the construction of storage reservoirs, and there seems no doubt that these reservoirs will be constructed in the near future.

It is estimated that an expenditure of $50,000 to $100,000 by the Government in that part of San Juan County will result in bringing 30,000 to 50,000 acres of the finest land in the West, all Government land, under ditch. This condition, however, is met with only in the La Plata Valley, in western San Juan County, as all the available lands along the Animas and San Juan rivers have an abundant and permanent water supply and no storage reservoirs are needed. However, the construction of larger canals and irrigating ditches will cover thousands of acres of new land on the upper mesas.

The La Plata Valley is at present one of the finest and best valleys in the county, and for the past twenty-five years farming and fruit growing have been carried on successfully and profitably on the first and second bottoms, where some of the richest and most productive ranches in New Mexico are located.

CLIMATE.

San Juan County has as perfect a climate as can be found on this earth. Its summers are cool, never oppressive at night, a temperature of 100° in the shade not being on record. The highest summer temperature is from 94° to 96°, but even 96° at the altitude of San Juan County, with mountains covered with perpetual snow within 75 to 100 miles, is not as oppressive as 85° in a lower and more humid portion of the country. The winters are always sunshiny and mild, with an absence of dampness and excessive precipitation that make even zero

weather delightful and exhilarating. There are on the average two hundred and thirty-five perfectly clear days in the year, about one hundred days, mostly in summer, on which clouds may be observed in the sky, and thirty days, also mostly in summer, that are cloudy.

In winter, during the day, the winds are from a southwesterly direction, passing over arid lands warmed by the sunshine, while at night, both summer and winter, they come from the snow-capped San Juan Mountains of southern Colorado, 60 to 100 miles away. There is no malaria lurking in the pure atmosphere, the county being free from ague, chills, and fever. For those troubled with consumption, other lung troubles of any kind, catarrh, asthma, bronchitis, rheumatism, and other chronic forms of disease, there is no better climate to be found. San Juan County is nature's own sanitarium for the consumptive. It was Helen Hunt Jackson who said that "climate is fate," after the sunshiny, arid climate of the Rocky Mountains had restored her to the health of which the humid, depressing climate of the East had robbed her. That success in life depends upon health, and that this, again, depends upon climatic conditions, goes without gainsaying, and therefore to grow up or to live in a perfect climate is to lay one of the foundations for success and happiness, and is fate indeed.

The most dreaded destroyer of all, the one which sends a mighty army of human beings annually to the grave, before whose ravages cholera, yellow fever, and other epidemics or the inroads of all other diseases sink into insignificance by comparison, is consumption. It is estimated that 125,000 persons in the United States are annually cut off in their prime or in middle age by this most insidious of all human ailments. Statistics show that 27 per cent of the deaths in this country are traceable to its agency. To those thus afflicted climate is indeed fate, the more so because the best medical authorities, whose conclusions are based upon experience and observation, agree that climate, or rather lack of climate, is the cause of most cases of consumption.

The fact is also established by official statistics that consumption and kindred diseases are much more prevalent in those sections of the country with a severe humid climate than in other sections. In New England, for instance, about 25,000 succumb annually to this destroyer, while in the States of New York, Pennsylvania, Indiana, Illinois, and Missouri, with their larger population, even a greater number are claimed by it. Consumption is alarmingly prevalent in Canada, Ohio, Michigan, and Wisconsin—in fact, in all northern and eastern sections of the American continent. The humid atmosphere of California, Washington, and Oregon claims many victims. In the Southern States, while the disease is not so prevalent, owing to the absence of overcrowded cities and a less stressful life, yet consumption there, too, demands many victims, while the Rocky Mountain plateaus alone are exempt from it.

An idea of the comparative prevalence of the disease in the different sections is given by the following percentages of deaths from consumption: Maine, 50 per cent; the rest of New England, 25 per cent; Middle Atlantic States, 19 per cent; Mississippi Valley States, 18 per cent; Southern States, 6 per cent, and New Mexico, 3 per cent; the deaths in New Mexico being those of persons who came to the Southwest in the last stages of consumption. There is no official record of any case of consumption having ever originated in the Territory. The disease is practically unknown to the natives. The children of consumptive

parents grow up in New Mexico without developing that predisposition to the disease which has caused many people to believe that consumption is hereditary. The percentage of people cured of consumption, even in the more advanced stages, is so large that the following statement from a physician practicing in the Territory is undoubtedly justified. He says:

There are more people in New Mexico who have recovered from consumption after having been given up by their physicians than can be found in all the other Commonwealths of the Union.

The fame of New Mexico as a sanitarium for persons suffering from or threatened with pulmonary disorders has become world-wide. In 1885 a committee was appointed by the International Medical Congress in session at Paris, France, to make a thorough examination and determine what parts of the world gave the best promise of possessing the climate most conducive to the recovery from consumption. The committee agreed that the best climate for consumptives was to be found in the valleys of a mountainous country, where there would be comparative immunity from the winds and storms which sweep over the plains and coast regions, while the proper temperature would be found between the thirty-second and thirty-sixth degrees of latitude at an elevation of from 5,000 to 7,000 feet, where the patient would not be exposed to the severe weather of the North nor the enervating influence of the South; and that the air should be dry, the rainfall small, and the sunshine the least broken by clouds and unfair weather. After visiting Egypt, Algeria, Cape Colony, Italy, Sicily, and other parts of Europe, Africa, Asia, South and North America, this committee determined that New Mexico afforded the necessary conditions in a higher degree than any other locality, excepting, perhaps, a small portion of northern Africa. The American Health Resort Association, whose physicians have traveled extensively and made a special study of climatic and kindred conditions, unequivocally indorse the report of the French physicians and recommend New Mexico as the most suitable section in the world for the arrest and cure of pulmonary diseases.

AGRICULTURE.

The agricultural products of the county are many and varied. Everything common to the south temperate zone is raised, including corn, wheat, oats, rye, barley, timothy, clover, cane, broom corn, alfalfa, and every variety of vegetables, in enormous quantities and of the best quality; potatoes, sweet potatoes, beans, pease, beets, and the finest quality of the sugar beet, turnips, pumpkins, squashes, melons, cantaloupes, and other vegetables.

Land properly irrigated and cultivated will produce per acre 30 to 40 bushels of wheat, 50 to 90 bushels of oats, likewise rye 18 to 30 bushels. Wheat sells at $1.60 per hundred pounds and oats at $2, while corn brought last year $1.65. The average price of alfalfa in San Juan County last winter was $6 per ton.

An example of what intense cultivation of the Animas Valley soil will accomplish is that of A. J. Gilmour, of Flora Vista. Mr. Gilmour has ranched near Flora Vista for the past eighteen years. From a tract of land covering 1¼ acres he year before last gathered and marketed 36,000 pounds of ripe onions, which netted him $540. He delivered the onions to the Hyde Exploration Company, at Farm-

ington, the sacks having been furnished by them. Besides the ripe onions 1,000 pounds of culls were sold. The crop that year, it should be stated, was 14,000 pounds short of the amount grown the year before on the same ground. On a small ranch near Cedar Hill from 9½ acres last year 310 bushels of wheat were raised and 20 bushels of alfalfa seed. The wheat was marketed at $1.20 per hundred, 78 cents a bushel on the ranch, and the alfalfa seed for $11 a hundredweight, a total money yield of $461.80, or over $50 an acre. The oats yield was 76 bushels per acre, worth at Durango $2 per hundred, or 64 cents a bushel of 33 pounds. The alfalfa yield averaged six tons to the acre, worth $6 a ton on the ranch for feeding range cattle which pasture in the hills and mountains during the summer and are brought to the valleys for winter feeding. This is not a corn country, the nights being too cool for its greatest development, yet on the same land the smallest yield was 41 bushels per acre and the average 46 bushels. This exceeds the average in the United States by over 10 bushels per acre.

A. U. Graves, of Cedar Hill, in 1901 produced 22,000 pounds of onions, or 366 bushels per acre. Watermelons, celery, and peanuts, hard and soft shell almonds, and walnuts are of favored return, while the San Juan cantaloupe, in its delicacy of flavor, generosity of yield, certainty of maturity, and robustness for shipment can not be surpassed. This cantaloupe is yearly increasing in its scope of both cultivation and market travel, and will soon be of cosmopolitan demand. Watermelons reach a weight of 40 pounds. Cabbages also reach that weight per head.

While no general test has yet been made, the soil and climatic conditions constitute a prediction that tobacco is to be a successful San Juan County crop at no distant day.

Popcorn attains a height of over 13 feet, while Indian-corn stalks reach above 12 feet.

The native grasses make excellent hay that yields 2 to 3 tons per acre.

The canaigre plant, with roots containing from 30 to 40 per cent of tannic acid, grows wild in the valleys and is the source of a coming and great industry. It is estimated that 100,000 acres are covered with this plant, with a production of 2½ tons of the roots per acre. The roots, which renew themselves annually, sell as high as $80 per ton for tanning purposes, and the extent of area covered by the canaigre plant in San Juan County is an inducement for tanneries to locate.

Sugar beets especially yield well in San Juan County. Tests made at the agricultural college experiment station at Mesilla Park have demonstrated that San Juan and Santa Fe counties, N. Mex., raise the finest sugar beets in the United States. They average 85 per cent in purity and yield 21 per cent of saccharine matter.

VALUE OF AGRICULTURAL LANDS.

Among the many questions asked through correspondence from homeseekers are those relative to the price and values of irrigated farms and lands. It is more difficult to answer these questions in a general way than it is of lands in other States, because there is quite a variety and difference in the location and adaptability of the lands in

San Juan County in reference to irrigation and nature of the soil. The price depends on the location of the land, whether or not it is flat, unbroken land, with just enough slope to irrigate it easily, or whether it is rolling and broken, so that it has to be leveled and prepared for irrigation at the expense of some time and labor. Another factor in the price is proximity to settlements, distance from the main roads, schools, and churches. The status of water rights belonging to the land, whether the latter is at or near the head gate of a ditch, where less work is required for irrigation than on land farther away from the head gate, all affect its value. The rule governing community ditches is that each landowner commences to work at the head of the ditch and works his pro rata share in cleaning and repairing the ditch to the lower part of his farm. Then his work on the ditch is done, while the landowner farther down the ditch must continue to work until he reaches the lower part of his ranch. Raw lands with perpetual water rights, but with no other improvements, if the lands are smooth and level and in a fair location, range in price from $15 to $30 an acre, according to distance from town and condition of land. Improved lands with perpetual water rights range in price from $20 to $60 an acre, while very choice locations are worth $100 an acre, this depending upon the nature of the improvements, orchards, etc.

A good bearing orchard will produce from $75 to $150 an acre, and even after paying all expenses connected with an orchard, the profit ranges from $50 to $125 an acre. It will thus be seen that an orchard of several acres upon a ranch that is worth from $100 to $200 an acre will make a material difference in its value. Land well seeded to alfalfa usually produces from 4 to 8 tons per acre of three crops or cuttings per year, the average alfalfa yield being about 5 tons per season. For the past three years alfalfa hay in the stack on the ranch has been selling not lower than $5 per ton and $8 per ton when baled, as it costs about $2.50 per ton to furnish wire and bale it. During the past year, when the season was somewhat severe, alfalfa hay sold at $10 per ton in the stack, and at the present writing is selling at $20 a ton in bales at Durango. Alfalfa hay can be cut, harvested, and put in the stack at from $5 to $6 an acre, which will leave a net profit of from $17 to $20 an acre on land that produces 5 tons to the acre, and it must not be forgotten that lands properly prepared and on which alfalfa seed is sown thickly, producing a good, heavy stand, require just as little work as the lands with an inferior stand. A good alfalfa stand on the average San Juan County land will produce 7 to 8 tons to the acre, so that an acre will produce from $35 to $40 worth of hay. Allowing $7 per acre for cutting, harvesting, and stacking, there is left a net profit of from $28 to $38 an acre as a net income from the land. It will thus be seen that for a 160-acre farm, with 10 to 20 acres of good bearing orchard and with 40 to 80 acres in alfalfa and the remaining portion in corn, small grain, pasture, and other crops, especially where such a farm has a good house, fencing, barns, and outbuildings, with a good ditch right and lateral ditches constructed for irrigating, anything less than from $60 to $100 per acre would be a very inadequate price. Take a farm in the best parts of Iowa, Illinois, northern Missouri, or eastern Kansas, or Nebraska that is worth $50 an acre, or $8,000 for 160 acres, and the owner thinks he is well paid if he receives $400 to $500 cash rent per year from it, even though he pays the taxes out of his pocket. Take a 160-acre farm in

San Juan County, in a good location with water right. Have 100 to 120 acres of it in fine tillable, irrigable land and the rest in pasture. Have 20 acres in orchard, 40 acres in alfalfa, and 40 acres in corn, wheat, oats, and barley, with a vegetable garden, and the annual income will seem very big compared with the income from an eastern farm of that size. The 20 acres of bearing orchard, even in the poorest fruit year, after paying all expenses, will yield $50 net profit per acre, or a total of $1,000. Forty acres in alfalfa, after paying all expenses, will yield a profit of $600 besides leaving sufficient for feed. The remaining 40 acres in grain and vegetables will yield from $400 to $600, making in the neighborhood of $2,000 per year net profit. As irrigation assures good crops, it will be readily seen that a 160-acre farm in San Juan County is a very valuable asset. There is no other place in the West where lands will yield more per acre when properly irrigated and cultivated than San Juan County. Yet many tracts of raw land with a good water right can be bought at from $15 to $30 an acre, while improved lands can be bought at from $25 to $100 an acre.

In the Rio Grande Valley and in the vicinity of Grand Junction, Delta, Montrose, and other fruit growing and agricultural districts in Colorado, such lands as here described are valued at from $100 to $300 an acre. Irrigated fruit lands in the Arkansas Valley about Canon City and Florence, within a short distance from Pueblo, Colo., are selling at, and are considered well worth when set out in nice three and four year old fruit trees, from $400 to $1,000 an acre. Yet the fruit from one apple tree in a San Juan County orchard is worth 20 per cent more in cash 40 to 60 miles from a railroad than is the fruit from the same kind of a tree in the Arkansas Valley. It is only a few years ago that the finest agricultural land in the country around Boulder, Greeley, Longmont, Loveland, and Fort Collins, Colo., was selling at from $35 to $60 an acre because crops were restricted to alfalfa, potatoes, and grains. But in the past two years beet-sugar factories have been located at nearly all of those towns in northeastern Colorado, and at Rocky Ford, Sugar City, and other points in the Arkansas Valley. This has advanced the value of farming land from $35 to $60 an acre to $100, $150, and $200 an acre.

ALFALFA.

Alfalfa is the great money-making crop of San Juan County. It is the finest hay feed grown in the world. It will yield more per acre per year than any other forage plant. It will answer more purposes as a stock feed than any other forage plant known to agriculture. The farmers who have learned the value of alfalfa do not feed grain to their stock unless for the heaviest kind of work on the road, such as freighting or heavy teaming. For average farm work alfalfa alone is the feed for horses. Cows need nothing more than alfalfa except on very special occasions. Alfalfa produces from 4 to 8 tons per acre and averages 5 tons. In San Juan County three crops can be cut. It is easy to get land to seed in alfalfa. When alfalfa is once set, it lasts for years and years without reseeding, improving in quantity and quality each year. Timothy, clover, red top, and other hays are not to be compared with alfalfa, though they grow and thrive in San Juan County as well as anywhere else. Yet they do not yield or pay as much per acre as does alfalfa. Alfalfa is king in the arid West.

HORTICULTURE.

No matter how good a country may be, if it is not a good fruit country, it lacks that much of being perfect. It may have good grass, good stock, be a good grain-producing country, rich in mines and many other products, but without fruit it is lacking. As a fruit country, San Juan County is preeminent, the peer of any part of the United States, no matter how favored. The abundant sunshine, the peculiarities of the soil, paint and enrich the fruit. San Juan County apples, on account of their freedom from blemishes and worms, and fine flavor, have been sold as high as $5 per 50-pound box in the Chicago market.

The following from the May issue of the Kansas City Packer tells its own story:

BEAUTIFUL APPLES—MIDDENDORF & CO. HAVE GENITANS WHICH BRING $3 PER BOX.

CHICAGO, *May 18, 1902.*—One of the prettiest sights the Packer man has seen on South Water street for many a day was a box of Genitan apples opened by A. L. Gibson, George Middendorf & Co.'s apple man. They came from San Juan County, N. Mex., and were held at $3 per box. These apples were in 50-pound boxes and almost uniform in size, and with a tint as delicate and beautiful as the blush that overspreads a gentle maiden's cheek. A box of Ganos at the same time were opened, and were perfection in their class, and were held at $2.50 per box. A few boxes of other varieties were also opened and displayed at the same time, and were selling readily at from $2.50 up to $4 per box. They were the finest and prettiest lot of apples that it has been our lot to witness in the Chicago market, and they were all from San Juan County, N. Mex.

For the past six years the fruit from San Juan County has been attracting especial attention. Not only the winter apples, which are the staple crop, but all other fruits common to the temperate zone. San Juan County produces not only apples, but also peaches, pears, plums, prunes, apricots, nectarines, quinces, crab apples, cherries, with all the small fruits and berries common to this country, strawberries, blackberries, mulberries, currants, gooseberries, grapes, persimmons, and all kinds of nuts, such as peanuts, almonds, and black walnuts. The mildness of the winters makes it possible to grow nearly all the tender varieties of deciduous fruits, such as apricots, nectarines, Japanese plums, prunes, almonds, etc. The Kelsey plum, one of the most luscious and highest priced plums, grows to perfection.

W. N. Kight, proprietor of the Sunny Side Orchard, a large and productive orchard of about 70 acres, with trees 10 to 20 years old, situated near Farmington, raises all the varieties of fruit named above. Although at a disadvantage, owing to the lack of railroad facilities, Mr. Kight last year netted $8.40 per tree. The trees yielded an average of twelve 50-pound boxes, which sold at from 60 to 90 cents per box on the packing table. It is not uncommon for a choice, large apple tree, when heavy laden with choice fruit, such as Jonathan, Rome Beauty, Genitan, Grimes Golden Pippin, Bellflower, or similar varieties, to net the owner from $10 to $12.50 and sometimes as high as $15 per tree in orchard. Trees often commence bearing after the third year. There are many orchards that have been bearing the past twelve, fifteen, and eighteen years, and some that have been planted twenty-two years, and these old orchards are the best and most prolific in the county. The big commission firm of Porter Brothers, of Chicago, has shipped much more fruit, especially winter apples, out of

San Juan County the past four years than any other firm. In the fall of 1900, 100 cars of winter apples were shipped from San Juan County via Durango alone. An entire train load was shipped over the Denver and Rio Grande Railroad, the cars bearing the legend: "All from San Juan County, N. Mex. A million apples and not a single worm." Porter Brothers say that the San Juan County apple is the best and the finest fruit; that it is more highly colored and flavored than any other apple that they buy; that it is free from worms; that it stands shipping better, and that it is the best shipper that they can get. It is a further fact that Chicago and other Eastern commission men buy more and pay more for San Juan County winter apples at the tree in San Juan County, 40 to 60 miles away from the railroad, than they pay for the very best commercial winter apples in the box ready for shipping at the depot in the best apple-producing sections of Michigan, Arkansas, Missouri, or eastern Kansas. The same commission firms say that more San Juan County fruit goes into the first-class market and more of it is sorted, repacked, and shipped to European markets, in proportion to amount produced, than of fruit that comes from any other section in the United States. San Juan County fruit has become world famous and the present shipments of 100 to 150 carloads of winter apples annually, at the highest cash market price paid for apples anywhere, are bound to be increased. In addition, large job lots are sent to the near-by mining camps, mountain towns, and lumbering settlements of Colorado and New Mexico.

If this is the condition at the present time, when the beautiful orchard industry of San Juan County is practically in its infancy, with the nearest railroad 40 to 60 miles away, what can not be expected in that line after the railroads come to the orchard belt, and after mining, milling, smelting, lumbering, and manufacturing interests of the surrounding country are more extensively developed? The person who secures the irrigated land and plants from 10 to 20 acres of choice fruit at this time and holds it and stays with it for a few years will have an independent income that will lead to plenty, and in time to fortune.

Said a writer recently:

To realize anything of the capabilities of San Juan County in the fruit line you must visit the orchards. Then you can see for yourself. It is impossible to do the subject justice in a written description. An orchard is beautiful at any time. Even in the winter the bare outlines of the trees, thrown sharp against the sky, have a beauty of their own. Spring, the blossoming time, with its snow-cheeked petals, flushed pink with joy at the new life pulsing through the old earth's veins, has been made famous alike in song and story. The trees of summer, with their green vigor, their depth of shadow, their delicate traceries, their dainty dancing to the merry breeze, have been extolled likewise by many a noble pen.

But the fall, sacred to Ceres and Bacchus, is the season of seasons. Then the orchards and gardens are ablaze with color, a feast for the eye, and palate, too, for that matter.

Rosy-cheeked apples, golden pears, velvety peaches, purple and pale-green grapes, yellow and crimson plums, form a scene of plenty that beggars description.

There is an orchard of some 14 acres situated about half a mile out of Aztec that is a pleasure to behold. Though smaller than some, it is wonderfully productive. That is true of the ranches around Aztec generally. As a rule, the tracts of land are smaller, but very closely cultivated. In this orchard you could pick for hours and make no apparent impression.

Apples and peaches generally bring 1 cent per pound on the orchard delivery table, with a yield per tree from peaches of from 300 to 800 pounds and apples 500 to 1,500 pounds, with exceptional apple trees

climbing as high as 2,000 pounds. In apple production 20-ounce apples are not rare. The largest apple ever grown in the valley weighed 28½ ounces, while the crack San Juan County premium box of this fruit contained 24 apples, with an aggregate apple weight of 25 pounds.

Pears sell at 2 cents per pound in the orchard, which means $400 per acre. Bartlett pear trees reach 1,250 pounds of fruit, while the great Idaho variety frequently attains an individual weight of 1½ pounds. The delicious sugar pear is probably the most prolific and profitable of San Juan County pears.

Cherries, with 100 trees to the acre, return from $3 to $4 per tree, while grapes, including the principal table, wine, and raisin varieties, are of heavy yield and profitable market. In one San Juan County vineyard 35 grape varieties can be noted. Six-year-old Concords yield 60 pounds to the vine.

Practically all plum and prune varieties are represented, the San Juan County capsheaf and crown of this fruit being the superb Prunus Simonia, which reaches the size of a tomato and combines the aroma of a muskmelon with the flavor of a banana.

San Juan County fruit is unsurpassed by the best California fruit, for it has a fine rich flavor that thus far has not been beaten.

One 11-year-old orchard yielded an average of twelve 50-pound boxes to the tree last year, worth from 40 to 60 cents a box on the packing table, the buyers doing their own packing. With 100 trees to the acre, such an orchard yields a snug income. The tree begins to yield paying crops the third year from setting. Premiums are won wherever this fruit has been exhibited, especially in competition with California and Colorado fruit. Fruit is often transshipped at Durango and goes to the Eastern markets as Colorado fruit, and has added much to the reputation of the Colorado apples, commanding the highest price in the market. At the Durango fair were exhibited 36 apples which weighed 40 pounds. At an exhibition of the Horticultural Society at Colorado Springs these apples won the first premium and diploma. Eight apples of this exhibit weighed 10 pounds. The Denver and Rio Grande Railroad Company paid $4 for them to use in another exhibit. The apples are clean, with no blemishes, and beautifully tinted, the product of the kisses of the New Mexico sun.

A profitable San Juan County fruit-growing practice is the keeping of fine sheep or Angora goats in the orchards the year around, thus at once keeping the orchard clean and feeding and fattening the animals themselves. Fruit grafting is very successful, as many as seven different fruit varieties finding lodgment on one tree.

The cottonwood, willow, and cedar are native growths, while in ornamental trees the valley has the Lombard poplar, the maples, the weeping willow, the locust, and the catalpa, while a great variety of roses, the honeysuckle, the snowball, and a world of other flowers adorn the lawns and beautify the gardens of San Juan County.

BEE KEEPING, POULTRY, AND DAIRYING.

Bee culture in San Juan County has passed the experimental stage. Several apiaries of 100 hives and upward are a good source of income, and almost every house yard has a few colonies for home use. The orchards, alfalfa fields, and especially the cleome or wild-bee weed

furnish inexhaustible pasture for the bees. Honey sells at 12½ cents per pound in the comb and 10 cents extracted, and in recent years the colonies averaged from 40 to 60 pounds each.

A resident of the La Plata Valley, in his seventy-eighth year, states that he left a 640-acre ranch in the San Luis Valley, Colorado, which had cost him, with improvements, $11,000, and which yielded an annual income of $2,700, to come to the La Plata country. He engaged in bee culture on 5 acres, and claims he clears more net money than on his former 640-acre ranch. He has 200 colonies of bees, which yield him about $10 per colony per annum. He also raises many chickens, and has a vineyard from which he produces wine. Part of his honey is sold at home and part shipped to the East.

Another apiarist in the La Plata Valley, George H. Eversole, settled in San Juan County sixteen years ago. He owns the State Line Apiary, the foundation of which was laid thirteen years ago. The average yield of honey from his bee colonies during the thirteen years of his experience has been 65 pounds per hive, the largest yield from any one colony being 168 1-pound sections of fancy honey. His bees are of the five-banded Italian variety, kept in the latest improved hives. He sold 3 tons of honey last year from 91 stands of bees.

Poultry raising and dairying give satisfactory returns to many farmers. The demand is always active for poultry, eggs, butter, and cheese; eggs bringing 20 to 30 cents per dozen; chickens $4 to $6 per dozen; butter from 25 to 30 cents per pound, and cheese 18 to 20 cents per pound.

Dairying is a rapidly growing industry, and undoubtedly several creameries will be established at central points as soon as railroad facilities are supplied.

LIVE STOCK.

San Juan County is a fine live-stock country. Little or no feed is required in winter, for the winters are generally mild and open, with but little snow, and in consequence live stock gets through the winter in fair condition on the open range, with feed needed only once in a great while during a severe snowstorm. There are from 40,000 to 50,000 head of sheep fed in San Juan County each winter, and from 8,000 to 10,000 head of cattle. Many of these cattle are of high-grade thoroughbreds, Short Horn, Herefords, Red Poles, etc. The stock is as a rule of good grade and is being constantly improved. It is only within the past few years that it has been demonstrated that alfalfa-fed cattle make the finest of beef and it is the cheapest beef that can be produced. For that reason stock growers and farmers are now acquiring the very best breeds of thoroughbred cattle (White Face, Short Horns, Red Poles, Poled Angus) for beef, with Jerseys and Holsteins for dairying purposes. It must be admitted, however, that in certain parts of San Juan County the range has deteriorated, owing to an excessive number of sheep, but just across the county line in southern Colorado, where the melting snows make many fine streams, there are to be found the finest stock ranges in the world. The stockmen of San Juan County, being adjacent to these ranges, drive their herds and flocks in as soon as the snow is gone, bringing them back in the fall to winter in San Juan County. This leaves the range in San Juan County for winter feed and gives opportunity to the Colorado range to recover from the summer's grazing. In conse

quence cattle, sheep, and goats cost less to raise in San Juan County than in any other part of the West.

Last year a large number of beef steers were fed and fattened for beef on alfalfa alone in the La Plata Valley, and in the spring of 1902 several hundred head of fine alfalfa-fed beef steers were sold at the feeding pens in the La Plata Valley at from $65 to $75 per head, and these same beef steers, fattened on alfalfa alone, with not a particle of grain of any kind, when shipped to Kansas City markets brought from $95 to $100 per head. A large amount of beef and mutton is sold on the local and near-by markets. Hogs live throughout the winter on nothing but alfalfa hay. When the alfalfa is growing a few acres well set and fenced will make the finest hog pasture. Of course, to make pork it is necessary in the last stages of the fattening to feed some grain to harden the flesh. Nowhere else can hogs be raised as cheaply and with greater profit.

Stock sheep very rarely require feed in the winter. There are times, however, when snow covers the ground for a few days at some points, and at those times it is better to have the sheep where they can be fed. But many sheep owners carry large herds throughout the winter on the public range without any feed. The same is the case with many range horses.

It must be said, however, that for stockmen who desire to run large herds, thousands of heads of range cattle on the open range, there are better localities than San Juan County, but for horses, sheep, and goats and small bunches of good cattle, a few hundred head, San Juan County is an ideal place. About 100,000 head of sheep are owned and razed in San Juan County.

The wool clip of last year amounted to three to four hundred thousand pounds. The assessment rolls show that there are 5,000 head of horses and from 3,000 to 5,000 head of goats in San Juan County. The number of goats is on the increase, because it has been demonstrated that the Angora goat business pays well in San Juan County. Goats need no feed the year around and thrive on the open range. The mohair finds a ready market at good prices, selling at from 40 to 60 cents a pound. Goats require less work and expense than any other kind of live stock and are generally more profitable. The raising of a good class of draft horses and road horses is proving a profitable occupation.

There are about 1,500,000 acres of public range in the county, exclusive of the Navaho Reservation.

MARKETS.

The fact that San Juan County has no railroad might be regarded as an indication that it is difficult to find a market for agricultural products, but then the surroundings of San Juan County must be considered. An extensive mining section depends upon San Juan County for its food products. The big and rich mining camps of the San Juan district in southwestern Colorado, such as Durango, Silverton, Telluride, Ouray, Rico, Ridgeway, Ophir, Oro Fino, Lake City, Summitville, Pagosa Springs, and others, offer splendid markets. When the number of people employed not only in the mines, but in the lumbering industry, smelters, coal mines, coking furnaces, in the cattle, sheep, and goat industry, in that section is considered, then it will be seen

that every bit of agricultural and horticultural product of San Juan County can find a profitable market. As it is, vast quantities of produce are daily shipped in from Kansas, Nebraska, Iowa, and Missouri, and more distant States. This produce is brought in over the only railroad that taps the San Juan mining district, the Denver and Rio Grande, and, there being no railroad competition, at a very high freight rate, which gives San Juan County farmers, who have only a comparatively few miles to ship, a great advantage. It is to be doubted whether there is any other agricultural county in the United States whose farmers, fruit raisers, stock growers, dairymen, and poultry producers realize as much for their products as the people of San Juan County. Corn will average 75 cents per bushel the year around. When wheat sells at 50 to 60 cents a bushel in the great wheat-growing States, San Juan County farmers receive 90 cents to $1.10 per bushel. Oats are nearly always worth 50 to 60 cents a bushel. Potatoes, which yield 100 to 200 bushels per acre, are worth from $1 to $2 per hundredweight. Onions, that yield so enormously, are worth from $1.50 to $2 per hundredweight. Pork, beef, mutton, and all other meats bring good cash prices. Chickens average from $4 to $6 per dozen, and eggs, even in summer time, sell at from 20 to 25 cents a dozen, and much of the time from 25 to 40 cents a dozen. Butter will average from 25 to 30 cents a pound the year around. Watermelons, pumpkins, cabbage, turnips, squashes, and, in fact, every variety of garden vegetable always command good cash prices. Durango, a busy little city of 6,000 people, with two large smelters, three banks, street railway, electric lights, cold-storage plant, flouring mill, saw and planing mills, brewery, railroad machine shops, city waterworks, three daily newspapers, etc., is the distributing point for San Juan County.

San Juan County products go to Salt Lake and all of Utah, while from Gallup supplies are sent to all parts of New Mexico and Arizona. The markets of all these thriving cities and towns in southwestern Colorado, western New Mexico, and eastern Arizona, many of them so situated that no garden and farm products can be raised in their immediate vicinity, assure a good price and high profits even after the payment of freighting and railroad charges.

The New Mexico portion of the great Navaho Reservation, with its almost 2,000 Indians, furnishes a valuable home market for San Juan County products. These regenerated red men own immense herds of sheep and goats, and carry on an ever-increasing manufacture of world-famous Navaho blankets, the annual wool, pelt, and blanket sales representing heavy revenues.

Immense quantities of flour, meat, lard, and similar products are annually shipped to San Juan County and surroundings from Kansas, Missouri, and other States. These could be readily produced at home. More home flouring mills would result in a greater acreage in wheat. The following are the ruling prices of products not mentioned elsewhere: Potatoes, from 1 to 3 cents a pound; sweet potatoes, 6 cents a pound. They are easily raised, and there is a good and ever-growing market for them. Wool brings from 9 to 15 cents a pound. The Navahos consume much wool in the manufacturing of blankets. The greater part of the wool, however, is shipped out of the county unscoured. There is a good opening for a scouring mill. Acreage in fruit at present time, 1,500; acreage in alfalfa, 8,000; tons of alfalfa cut per year, 50,000; pounds of wheat, barley, and oats produced

annually, 600,000; pounds of corn produced annually, 50,000; boxes of apples shipped annually, 12,000; boxes of other fruit shipped, 20,000; pounds of onions raised annually, 200,000; pounds of honey shipped annually, 20,000.

HIGHWAYS AND RAILROADS.

San Juan County is at present the only county in New Mexico without railroad communication, but there are three very good principal wagon roads traversing the county. One of these is the public road from Durango, Colo., along the Animas River by way of Cedar Hill, Aztec, Flora Vista, Farmington, Fruitland, and Jewett. Then there is a public road from Durango southwesterly over the San Juan Divide into the La Plata Valley, thence to Farmington by the La Plata River, to Fruitland and Jewett over what is known as "The Meadows." The third public highway is from a point on the Denver and Rio Grande Railroad known as Ignacio, by way of La Boca, down the Pine River Valley to the San Juan River, thence to Largo, Blanco, Bloomfield, and Farmington. A regular daily stage line is run from Durango, Colo., by way of Aztec to Farmington, which carries the mail and passenger traffic into the county. The run is made in about twelve hours, the stage leaving Durango for Farmington and Farmington for Durango every morning, a change of horses being made at Aztec and at State Line, the entire distance being about 60 miles.

Three railroad lines have been surveyed lately to and through the county and will undoubtedly be built within the next few years. The most important is that of the Santa Fe Central Railway from Algodones, in Sandoval County, to Durango. This railroad will tap the immense coal fields of San Juan County, and will cut through the county from near its southwestern corner, by way of Farmington and Aztec, to Durango. The Santa Fe Central Railway will give direct connection with Santa Fe, the capital of New Mexico, and, by way of Torrance, with the great Rock Island system, and, by way of Roswell, with the Gould systems of Fort Worth and the Gulf of Mexico. This line will place San Juan County ultimately on an air line from Salt Lake to Fort Worth and Galveston.

Another important survey is that of the Colorado and Gulf or Clifton line, from Durango, Colo., to Clifton, Ariz., by way of Gallup. This line will cut through the county from north and south.

The Denver and Rio Grande Railroad Company has also made a survey through the county, which is to run from the northeastern corner to the western part to a direct connection with San Pedro Harbor, near Los Angeles.

The Atchison, Topeka and Santa Fe Railroad Company has in view a line from near Gallup to Durango, which, too, would tap the extensive San Juan County coal fields and would undoubtedly prove a very profitable venture to that company.

TELEPHONE.

During the past year a telephone line has been completed from Durango, Colo., through San Juan County, by way of Aztec and Farmington. The line is being extended to Fruitland, its entire length when completed to be 75 miles. This line connects with the

long-distance telephone line to Pueblo, Colorado Springs, Denver, and other points, as well as with the mining towns and lumbering camps of southwestern Colorado. It is the intention of the telephone company to extend its line later to Thoreau on the Santa Fe Railway, and from there to Albuquerque and El Paso.

COAL.

San Juan County has the finest and most extensive coal fields of any section of the West. Thousands of acres and whole townships in the western part of the county are underlaid with strong veins of the finest quality of coking coal, the veins being from 5 to 60 feet thick. At many places these veins crop out on the surface. The coal belt extends from the head of the La Plata Valley southward through the Meadows and on to the San Juan River at Fruitland and Jewett, down to Gallup, in McKinley County. At Durango, Colo., the upper end of these coal fields, and at Gallup, at the southern end, millions of tons of coal have been mined. At Durango are large coke ovens, and it is only a question of railroads and time when the coal beds of San Juan County will give work to thousands of miners. Most of the coal veins are on Government land, and subject to entry under the coal-land laws at the price of $10 an acre when more than 15 miles from a railroad, and $20 an acre when within 15 miles. At present there is only a limited market for San Juan County coal, owing to the lack of railroad facilities, but it is only a question of a short time when 160 acres of coal land will be worth much more than $1,600, the price for which it can now be bought. Aztec and Farmington, being 10 to 15 miles from this coal belt, must haul their coal that distance. It costs them from $1 to $1.50 per ton at the mines, and delivered the coal costs them from $4 to $4.50 per ton. Only enough is mined to supply the home demand. Several outside companies have made entries upon several hundred acres of coal lands with a view of the coming of railroads in the near future, but the greater amount of coal land remains subject to entry. Such immense bodies of coal midway between the gold and silver mining districts of southwestern Colorado, and the copper mines and smelters of southeastern Arizona, which must ship in their coal all the way from Kansas and even West Virginia, will eventually be of great commercial value. At Clifton and Jerome, Ariz., coal is sold at from $10 to $12 a ton. With the San Juan County coal fields only from 300 to 400 miles distant, Arizona will not much longer pay tribute to the railroads for coal. The coal traffic alone would pay the running expenses of a railroad tapping these coal fields.

W. H. Thomas is working a few men on the Thomas coal mine. The nearest railway station, and practically the only railway point in San Juan County, is La Boca, in the extreme northeast corner, 45 miles from Aztec, while from the Thomas coal mine, on the La Plata, it is only about 25 miles to the nearest railroad point at Hesperus, on the Rio Grande Southern.

The coal seam is the thickest in the Territory, being 60 feet thick, with 40 feet of good marketable coal. The vein at this point is faulted and the upthrow shows a transverse section of the seam, the dip of which is 25 degrees. The development consists of a drift entry driven across the dip about 250 feet. Only 400 tons of coal were taken out last year and sold to the farmers of the La Plata Valley.

The Stevens mine lies 2½ miles from Fruitland on the San Juan River. It is owned by E. S. Young, but is operated by Thomas Evans under lease. The nearest railroad point is Durango, Colo., 70 miles distant by wagon road. The coal is bituminous. The vein is 12 feet thick, 10 feet of which is a clean, marketable coal, lying horizontal. The mine is worked by the drift, entry, room, and pillar systems. The main drift is in 350 feet. The total output last year was 1,100 tons, sold in Farmington, Fruitland, and the San Juan Valley.

The Morgan mine, near the settlement of La Plata, has three coal seams, respectively, 5, 6, and 40 feet in thickness. The coal is a good grade of bituminous in the larger vein and semianthracite in the smaller vein.

The Bruce mine, near Fruitland, is being driven in upon a vein of bituminous coal 11 feet in thickness.

OIL.

Although the oil excitement is and has been at a fever heat all over Colorado, Texas, and New Mexico, San Juan County, on account of its isolated position, has not been pushing to the front in that respect, although it is in the center of what is pronounced one of the greatest oil basins in the Southwest. Members of the United States Geological Survey, as well as Professors Lake and Hayden, authorities on the subject, pronounce the oil indications of San Juan County as especially promising. A number of companies have been organized for the development of the oil, and two companies have been drilling wells in different parts of the county, while at Farmington more development work has been done than at any other point. But thus far only a depth of from 300 to 400 feet has been reached, owing to the lack of proper machinery. The coming of railroads will undoubtedly put San Juan County in line as an oil producer. The San Juan County oil fields, as far as explored, cover about 100,000 acres, of which 60,000 acres have been filed upon. But many of the filings have lapsed or will soon lapse because their owners have failed to do the development work required by law. The oil that comes to the surface has 18 per cent of illuminating power. The largest oil holdings are several thousand acres, choice land, held by a California syndicate, which is successfully operating in several Western oil districts, and which has great confidence that San Juan County will be a big oil producer.

OTHER MINERALS.

There are indications of placer gold along the San Juan River. The Navaho Reservation, which will sooner or later be thrown open to settlement, is rich in gold, silver, and copper. Lime is found in large quantities throughout the county. Especially fine deposits are located near Fruitland and are worked for home use. A good red and white sandstone for building purposes is found in the La Plata Valley in unlimited quantities. Tile clay is abundant and fire-clay beds have been located but are not being worked. Near Farmington exist borax beds, and in other parts of the county are extensive gypsum deposits. Timber exists in sufficient quantities for mining as well as for fuel purposes.

MANUFACTURES.

While San Juan County is mainly an agricultural section, its immense beds of coal, the ease with which raw material, such as sugar beets, hides, canaigre, wool, etc., can be supplied, and the proximity of the markets of the surrounding mining country, are all inducements for manufacturers to locate. The abundance of water power will eventually prove a factor in the establishment of tanneries, woolen mills, beet-sugar factories, potteries, creameries, distilleries, evaporators, flour mills, and other manufacturing enterprises especially adapted to that section. The census of 1900 credits San Juan County with only eight manufacturing establishments, with an invested capital of only $12,150, using annually $10,483 worth of raw material, and putting out a finished product of $20,040. At Farmington there is an evaporator, a distillery, a flouring mill, a planing mill, and a meat-packing establishment. At Aztec there is a flouring mill. At Pueblo Bonito the manufacture of Navaho blankets is carried on upon a large scale, Navaho squaws being given employment for that purpose.

THE INDIANS.

The fact that San Juan County adjoins the Navaho Indian Reservation may create a false impression among Eastern people. The Navahoes are peaceable, industrious, and far advanced in civilization. They rarely leave the reservation except to dispose of their wares or to buy supplies, or work on the railroad or in Colorado sugar-beet fields. The Navahos are extensive stock owners and are far famed for the blankets they weave. They are self-supporting. The Utes, however, on an adjoining reservation, receive Government subsidies, and these find their way into the regular channels of trade of San Juan County. The Utes, too, are peaceable, and, in many instances, industrious.

The Navaho Reservation, with its 2,000 Indians, furnishes a good home market for San Juan County products, the Indians owning large herds of sheep and goats. A chain of trading and supply posts has been established on the reservation, and between 40,000 to 50,000 blankets are annually exchanged by the Indians for other products. The blankets average 7 pounds in weight and bring the Indians about $1 a pound.

ATTRACTIONS FOR TOURISTS.

San Juan County is not bare of attractions for tourists. Besides its beautiful orchards, waterways, and good fishing there are many bits of beautiful and rugged scenery. A great wonder are the extensive Aztec ruins, with their castles of stone, mortar, and masonry, which can be traced the lengths of the La Plata, Animas, and San Juan rivers, together with the outlines of long irrigating canals which are at least one thousand years old if not older. Before the landing of Columbus in the West Indies this valley was thickly populated by a highly intelligent people, who tilled the soil, raised crops, had fowls, built houses of five to seven stories, and reared immense structures of stone and mortar that contained from 500 to 1,200 rooms. Buried deep in these ruins are found petrified corn cobs, turkey bones, stone mortars, and many other evidences of a semicivilization. In Chaco Canyon, which empties its waters into the San Juan, is the pueblo of

Bonito, which, with adjoining ruins, is an archæological marvel. Several of the larger structures are of dressed stones and contain 1,200 rooms, the buildings being five to seven stories high. At Bonito there is a lower city in the valley and a city 200 feet higher on the mesa, connected by a stone stairway up a steep bluff over 150 feet high. For many miles in the Chaco Canyon, as well as in the tributary canyons and valleys and upon the higher mesas, are the remains of a prehistoric civilization. Along the Animas, the La Plata, the San Juan, the Largo, the Gallegos, and Chaco, irrigation canals were watering fertile valleys and supporting a dense population long before the Spaniards came up the Rio Grande Valley. In those days the water supply of the county must have been greater even than to-day, for many of these buildings are found along canyons which are now dry the greater part of the year. In the Chaco Canyon alone there are the ruins of seventeen villages. The wealth that awaits archæologists who will carry on systematic research in this part of the country can be gleaned from the fact that the Hyde Exploration Company in exploring Bonito has excavated 500 rooms, in which it found 50,000 pieces of turquois, 10,000 pieces of pottery, 1,000 stone implements, and many other relics, as well as many skeletons. At Bonito quite a trading post has been established with accommodations for visitors.

Next to Pueblo Bonito, the most interesting prehistoric ruins are near Aztec. On the Navaho Reservation there are many sights and scenes that are worth going many miles to see. From the junction of the San Juan and the La Plata below Farmington the view of the surrounding country is grand. To the west and far down the valley towers Ship Rock, a peak 1,200 feet above the mesa, like a giant ship with all sails set. In the southwest, on a high crag, are seen "The Angels," two stone images bearing great resemblance to the conventional messengers of heaven, standing as silent guardians of the peace and prosperity so abundant in the surrounding country. Along the southern horizon stretch high, rolling mesas or the bluff, weather-worn faces of cliffs. On the north rise the snow-crowned summits of the blue La Plata Mountains, and over all is the sheen of an arid sky, toning from the vivid gray background of the horizon to the lovely turquois blue of the zenith. This impressive prospect takes in a country stretching almost 100 miles in every direction, in fact, as far as the eye can reach.

To those seeking a quiet retreat amidst orchards and fertile farms, San Juan County offers many attractions. The cost of living is low, board being from $4 a week with farmers to $7 a week at the hotels. For health seekers there are opportunities for light employment, such as bee keeping, poultry raising, or light farm work. Game is plentiful in the county. In the rivers and streams fish are abundant. The lower reaches of the river contain white salmon that reach a weight of 25 pounds, while the upper courses are good trout streams.

POPULATION.

Being so far distant from railroads, the increase of population of San Juan County is not phenomenal, but nevertheless the county is being settled up rapidly. The census of 1900 gave the county a population of 4,828, and at present it has a population of 6,500. The population by precincts in 1900 was as follows: Farmington, 548; Aztec, 458;

Fruitland, 397; Blanco, 318; Largo, 316; Bloomfield, 246; Flora Vista, 236; La Plata, 221; Cedar Hill, 175; Pine River, 166. There are 1,800 Indians on that part of the Navaho Reservation within the county. The tide of immigration into San Juan County has been thus far mostly from Missouri, Colorado, Kansas, Nebraska, and the Northwest, although almost every part of the United States and Canada is represented. The people are law-abiding, thrifty, industrious, and energetic. Only one-tenth of the people of San Juan County are of Spanish or Mexican parentage, and these live apart in two or three settlements. They are intelligent and honest and many of them speak both English and Spanish and are well off financially. But the people of the lower San Juan Valley, from about 20 miles above Farmington as well as along the Animas and the La Plata, including the settlements of Farmington, Fruitland, Aztec, and Olio, are entirely English speaking, with modern schools, good churches, and good society. It is difficult to find a county anywhere in the United States in which so little crime is committed and which has so little litigation. The lawyer and the doctor find but little to do, because of the healthful climate and the peaceable conditions.

VALUATION AND TAXES.

The assessed valuation of the county is $679,491. As it is customary to fix assessments at from one-third to one-half of the real value, the assessment gives no idea of the real wealth of the county, but it guarantees that taxes are comparatively low, although the tax rate may apparently be as high and in some instances higher than elsewhere.

SCHOOLS.

San Juan County, like every progressive American county, takes great pride in its public schools. There are 25 organized school districts in the county. The average length of school term in the rural districts is from four to five months, while in the richer districts school is held annually from five to seven months, while at Farmington and Aztec the school term is from six to nine months. The teachers' wages range from $35 to $75 per month. Farmington and Aztec have graded schools with from three to four teachers. At Aztec there is a good private normal school and at Jewett there is a large mission school. The Government maintains schools on the Navaho Reservation.

CHURCHES.

Every settlement has its church, and the Protestant denominations as well as the Roman Catholic Church are well represented. The Mormons have established several flourishing settlements in the county, the leading ones being at Fruitland and Olio, but they are no factor in the political life of the county.

TOWNS AND VILLAGES.

San Juan County has no large cities, but there is no doubt that with the coming of the railroads its two principal towns, Aztec and Farmington, will expand rapidly.

A description of Aztec and Farmington is given under the head of "Cities and towns of New Mexico."

Fruitland is a prosperous little town on the San Juan River, 12 miles west of Farmington. It has a general store, church, schoolhouse, blacksmith shop, and other evidences of thrift and enterprise.

Flora Vista, or Flowery Vale, is very picturesquely situated 6 miles south of Aztec on the Las Animas River, in the heart of a very rich, agricultural, and fruit-growing country. It has extensive and beautiful orchards, large alfalfa fields, and is one of the prettiest spots in the county. It has a general store, post-office, and blacksmith shop; a public school building; and two of the neatest churches in San Juan County, Methodist and Presbyterian.

Jewett is also a post-office settlement on the San Juan River, not far from the boundary of the Navaho Indian Reservation. A large mission for the benefit of the Indians is maintained there.

Fruitland, Jewett, and Olio are all prosperous settlements in the broad expanse of San Juan County west of Farmington, through which the Animas, La Plata, and San Juan Canal, known as "The Coolidge Ditch," has been constructed at an expense of $100,000 by Scranton, Pa., capitalists.

On the San Juan River, northeast of Farmington and east of Aztec, is a trading post, the post-office of Bloomfield, which is the center of a good agricultural district in the broad valleys of the San Juan. Twenty miles north of Aztec, on the San Juan, are the settlements of Largo and Blanco, the centers of the Spanish-American settlements which extend along the upper San Juan to the Pine River. At Largo and Blanco are public school houses and church buildings and general stores. They are the trading points for that large agricultural section which the Santa Fe Central Railway will cross on its way from Algodones to Durango.

Fifteen miles west of Aztec, in the La Plata Valley, across the divide between the Animas and La Plata rivers, are "The Meadows," which, with the La Plata Valley, form the finest part of San Juan County, being large bodies of sloping land easy to irrigate, and composed of what is known as California red soil, which is the richest and most productive soil known in the West. These rich and fertile valleys are underlaid with immense coal seams of fine coking coal, and for the reclamation of this land the Government is making the prelimi nary surveys for the establishment of an irrigation system.

Ten miles north of Aztec is the village of Cedarhill, on the public road from Aztec to Durango. It has a post-office, a general store, a Union Church, and a blacksmith shop. It is surrounded by prosperous farms. Hood, Laplata, and Putnam are post-offices and trading posts.

The San Juan County Stores Company's project to establish banks at Aztec and Farmington will help much toward the further development of San Juan County. The banks will be capitalized at from $30,000 to $50,000. These institutions will fill a long-felt want, and they will not only do a banking business but will be prepared to make farm loans to parties desiring such at long time and upon reasonable terms.

INDUCEMENTS TO IMMIGRANTS.

No other part of the great West offers so many and such splendid inducements to new settlers at this time as San Juan County, N. Mex. The development has just begun. The county is yet in its infancy, and

nature has done more for San Juan County than for almost any other locality in the Southwest.

No other part of the West has so many homes and so few mortgages in proportion as San Juan County. The county offers many safe and profitable investments at this time. Men with even limited means can acquire small tracts of land that will make them an independent living and happy homes, while the men with more means and more capital can possess superior farms with fine homes and better improvements in the finest climate on earth.

When the feed stores and livery stables in Durango, Silverton, and Telluride must ship their corn, oats, and alfalfa from the San Luis and Arkansas valleys, and the hotels are compelled to send for their potatoes to Greeley, Denver, and Kansas, and must go to Kansas, Iowa, and Nebraska for turkeys on Thanksgiving Day, for chickens on Sunday and for eggs every day, it is certain that there exist splendid opportunities for the farmer, the horticulturist, the live-stock raiser, the poultry raiser, and the apiarist in San Juan County. Said a writer recently:

> And now we come to a country the wealth of whose resources has never been fathomed; a country fertile in soil, rich in fuel, perfect in climate; a country where every man, woman, and child has money; a country which is a granary when feed fails elsewhere; a country where the fruit-laden trees, their branches borne to the ground, rest from their burden only when the welcome picker has come to their relief; where the fine cattle, horses, and sheep, grazing lazily on the broad alfalfa meadows, growing hourly into money, make one feel that he has at last reached the land of promise.

FINANCIAL STATEMENT OF SAN JUAN COUNTY.

Total indebtedness of said county up to and including June 30, 1902, $20,856, composed of the following amounts:

Bonded debt.

Date of issue.	Date of maturity.	For what purpose issued.	Rate of interest.	Amount.
			Per cent.	
Dec. 30, 1889	Dec. 30, 1919	Current expense	6	$8,000.00
Sept. 1, 1892	Sept. 1, 1922	Jail bonds	6	2,500.00
Jan. 1, 1893	Jan. 1, 1923	Current expense	6	4,000.00
Oct. 1, 1892	Oct. 1, 1922	Judgment	6	2,600.00
Apr. 1, 1894	Apr. 1, 1923	Current expense	6	3,000.00
Total bonded debt				20,100.00
Outstanding accounts approved and unpaid to June 30, 1902				756.00
Total indebtedness				20,856.00
Total assessed value of real and personal property for the year 1903				679,491.00

SAN MIGUEL COUNTY.

Area, 5,001 square miles. Population, census of 1900, 22,053; present population, 25,500. Assessed valuation, $4,450,000. County seat, Las Vegas.

Officials.—Commissioners, J. F. Esquibel, Ramon Gallegos, A. T. Rogers; probate judge, S. Baca; probate clerk, A. A. Sena; sheriff, Cleofes Romero; assessor, Jose Santos Esquibel; treasurer, Eugenio Romero; superintendent of schools, J. M. Quintana; surveyor, A. Fresquez.

Newspapers.—The Daily Optic, the Weekly Optic and Stockgrower, El Independiente, La Voz del Pueblo, La Revista Católica, Weekly Advertiser, and The Mountaineer; all published at Las Vegas.

Post-offices.—Las Vegas, Chapelle, Fulton, Pecos, Ribera, Rowe, San Jose, San Miguel, Sena, Tecolote, Villanueva, Willis, Mineral Hill, Hot Springs, Sibley, Onava, Sanchez, Trementina, Bellranch Jardin, Beulah, Cabra, Chaves, Chaperito, Gallinas Spring, Guillon, Los Alamos, Rociada, Sapello.

San Miguel, the "Empire county" of New Mexico, is not only one of the most favored sections of the territory in point of early settlement and subsequent development, but it presents such a diversity of resources that homeseekers and investors are alike attracted to the region.

In the development of the stock interests San Miguel County has set the pace for the other counties of the territory, and now it is considered the hub of the cattle-raising and wool-growing business. The county is singularly blessed in the matter of water—an absolute necessity to a good stock country. The Rocky Mountains, which form the western boundary of the county, the Turkey Mountains on the north, and the Sabinos and Huerfano Mountains on the east, combine in giving the county an altitude which insures heavy precipitation. In fact, the region is blessed with a "rainy season," extending from the middle of June until the last of August, which provides the countless streams and hundreds of natural reservoirs dotting the plains with an abundance of water until the volume is augmented by the snows of winter.

A letter from C. M. O'Donel, manager of the Bell ranch, to the Las Vegas Board of Trade, gives in a general way information relative to the resources of that portion of the county lying east of the meridian 104°, and will apply to all sections of the county, except those vitally affected by the mining industry. He states:

> Owing to the fact that the larger portion of this area is occupied by a private land grant, the rate of population per square mile is low. But on the land which is subject to settlement, the water courses are fully occupied by a population which is generally industrious and law-abiding.
>
> The principal industry is stock raising, cattle and sheep predominating. I estimate the cattle in this area at 25,000 head, the sheep at 30,000, and range horses at 1,000. The cattle are of very good quality, grading as high as any in New Mexico, and the owners are showing an increased interest in improving the quality of their stock. This applies to sheep as well as to cattle.

Agriculture on the "temporal" system is carried on in a desultory manner wherever a rich piece of bottom land affords the opportunity. Corn and beans represent the principal crops planted. The product is precarious and at no time large. Exception must be made, however, in the case of the thriving community of Cañon Largo, where orchards and gardens flourish under ditch, and a quantity of fruit and vegetables is produced annually in addition to the staple food products—beans and corn.

There is a school in every neighborhood where a few children can be gathered, and while the education to be obtained in these schools is not of a high order, the children can be fitted for the better institutions of learning afforded by the cities of the Territory.

There are considerable tracts of land in this section suited to the raising of Angora goats—a highly profitable industry—and many people now contemplate availing themselves of the opportunities offered.

The most important economic factor in this part of the county at present is the completion of the El Paso-Rock Island Railway extension from Liberal, Kans., through Santa Rosa, N. Mex. While the railway only passes through the extreme southwestern corner of the county, it adds greatly to the transportation facilities of the people. Another railroad connects the Rock Island at Tucumcari, which is located near the south line of the county and runs in a northwesterly direction to Dawson, Colfax County, having a trackage in San Miguel County of about 40 miles.

The area of the region covered by Mr. O'Donel in his letter is about 30 by 40 miles, and although San Miguel County is larger than the State of Massachusetts and with one-fourth the population of Wyoming, his observations can be said to hold good in nearly all other portions of the county.

THE BELL RANCH.

The above ranch, owned by the Bell Valley Land and Irrigation Company, is probably the best breeding ranch in America. It contains about 800,000 acres of land, all inclosed. The Canadian or Red River waters about 80 miles of the ranch, measuring the meanderings of the stream, and the many small tributaries make it a wonderfully fertile and well-watered tract. The usual run is 20,000 to 50,000 head of cattle, with the usual complement of horses. The stock is well graded, being composed of Herefords and Durhams. The ranch possesses, in addition to branding corrals, a store, post-office, men's quarters, stables, brick corrals, and a stone residence having 200 feet front, with a 100-foot ell. It is located about 80 miles east of the city of Las Vegas, in the tract described above by Manager O'Donel.

CATTLE INDUSTRY IN GENERAL.

The rich valleys of San Miguel County have proven especially alluring to the owners of small herds of cattle and those who make a specialty of finely bred stock, while the rolling foothills, flanked by great plains, ending abruptly against the sides of extensive mesas furnish an abundance of nutritious grasses for the needs of the range stock owned by the large companies. The mild winter climate, absence of death-dealing blizzards and hailstorms, makes this section the best breeding grounds in the United States. The wild grasses seed late and cure into hay on the ground, furnishing an abundance of feed for the winter and making cattle breeding comparatively inexpensive.

During the year 1900, 187,962 head of mostly steer cattle were sold and removed from the Territory, of which number San Miguel County

furnished 7,500 head. It is estimated that there are now grazing in the county 70,000 head of cattle. Not once during the year of 1902 were the services of a veterinarian needed to stamp out disease.

The range cattlemen have of late paid out considerable money in introducing good blood into their herds, and are rapidly eliminating undesirable breeding stock. As an example of what effect this course has had, the Bell ranch sold on the Kansas City market recently a string of yearling steers for $23.40 per head, and thousands more of the same class were wanted at the same figure.

That there is room for the extension of the cattle industry of the county is evinced by the fact that cattlemen assert that the production of cattle on the practically free pastures can be twenty times increased without overloading the range, and the school sections are being rapidly leased from the Territorial land board for grazing purposes, and all available public land is being taken up in 160-acre ranches, during the fiscal year ending June 30, 12,548.31 acres having been thus taken up, 12,208.31 acres being homestead land.

In the city of Las Vegas is located the headquarters of the Territorial cattle sanitary board, and a majority of the cattlemen of the Territory make their headquarters or homes here. While the herds of many of the cattlemen range in Colfax, Guadalupe, Union, and Mora counties, the industry throughout the northern and eastern portions of the Territory pays direct tribute to the county of San Miguel and the city of Las Vegas, and thus does this locality furnish a simile to the cities of Denver, Colorado Springs, and Pueblo, into whose laps are tossed the mineral wealth of the central counties of Colorado.

THE SHEEP INDUSTRY.

This industry is not only preeminent in New Mexico, but also in the county of San Miguel. Of the 20,000,000 pounds of wool produced annually in the Territory this county grows 2,000,000 pounds, and its markets handle over 10,000,000 pounds. Sheep men of the eastern, northern, and southern counties market the greater portion of their product in Las Vegas, whence it is shipped to the eastern markets. Five wool-scouring plants are located in Las Vegas, each having a capacity of 5,000,000 pounds of wool per year, and they are now considered insufficient to handle the supply and other plants are being erected.

Of the estimated number of sheep in the Territory at present—over 5,000,000—San Miguel County possesses about 400,000. Of the 100,864 sheep brought into the Territory, 20,000 feed on the ranges here.

In consequence of the county being mountainous and having an abundance of water and grass, the percentage of loss is reduced to the minimum, and the mutton brings a good market price at all times. The market price for lambs of the first feeding ranges from 3 to 4 cents per pound, netting the grower from $1.25 to $1.75 per head.

As is the case among cattle raisers, the sheep men are rapidly enhancing the value of their flocks by improving the blood through the introduction of fine rams.

The annual cost of running sheep in this county is estimated at 30 cents, and the percentage of increase is estimated at between 75 and 100. The present selling price of ewes is $2.50, yearlings $2, and six-

months' lambs at $1.75. Sheep raising in this county is considered the most profitable business in the West to-day, and many evidences are offered daily of people who started in the business from ten to twenty years ago with practically no capital and to-day find themselves worth from $50,000 to $100,000.

THE GOAT INDUSTRY.

This business is constantly increasing, the number of small flocks owned by the small owners being almost innumerable. It is only within the past few years that the hides of the common New Mexico kid began to be especially valued and considered an article of commerce capable of exercising an extensive influence in the business world. However, it is now considered in the best markets of the world that the hides are unsurpassed for making varieties of the finest kid leather. European buyers, as well as those of the Atlantic coast cities, are constantly seeking them, and in consequence the business of rearing the hardy little animals is growing to considerable proportions in this county.

The Angora goats, valuable alike for wool, meat, and hides, are worth $5 per head.

EDUCATIONAL ADVANCEMENT.

The constantly increasing population, the commingling of other nationalities with the natives in social and commercial intercourse, have afforded the necessity for constantly increasing efficiency in the educational system of the county, and the progress made has been both noteworthy and commendable. Las Vegas, the county seat, boasts of facilities for thorough education in both the Spanish and English languages, not only as applied to the common school system, but also in higher branches, which will fit the rising generation for any profession in life.

From the report of the county superintendent of schools it is learned that the county possesses 93 districts, namely, South Las Vegas, East Las Vegas, Las Vigiles, North Las Vegas, San Miguel, Villanueva, Lagunita, El Pueblo, Sapello, Las Alamos, Las Torrez, Rociada, San Jose, Puertocito, La Concepcion, Jolla, Largo, Penasco Blanca, La Liendre, Las Mules, Chaperito, Pecos, El Cerrito, El Mestino, Bernal, Upper Las Vegas, South Manuelitas, El Tecolote, Las Gallinas, La Aurora, San Augustin, Sheridan, San Geronimo, El Porvenir, El Rito, Salado, El Sabinoso, San Patricio, El Cuervo, Liberty, Rowe, Las Gonzales, San Lorenzo, Ojitas Trias, Rociada (Arriba), Canada del Terromete, El Macho, Las Vegas Hot Springs, El Tecolotito, Pajarito, Valles de San Lorenzo, La Cebadilla, Canoncito de Rociada, El Corazon, North Manuelitas, San Ignacio, Las Conchas (Arriba), Gallinas Springs, North Colonias, Agua Sarca, Emplazado, Variadero, Canon Largo, Jaramilloville, La Entranosa, San Pablo, Canada de Aguilar, La Manga, Canon de Manuelitas, Las Conchas (Abajo), El Aguilar, Trementina, Las Dispensas, La Encinosa, El Chapadero, South Colonias, El Gusana.

The number of schools in the county, excepting Las Vegas city, is 82; average attendance during the year ending June 30, 1903, 3,100. Cash balance in the treasury August 1, 1903, $12,300.

However, the public is afforded a much more complete school system than that included in the report of the county superintendent of schools. In 1869 the Sisters of Loretto established a convent and school for girls in Las Vegas, which is still flourishing. The average enrollment of pupils ranges from 180 to 200. The property of the school is worth about $15,000.

The Presbyterian mission school, also located in Las Vegas, was established in 1870, and has accumulated property worth nearly $20,000. The institution employs two teachers and the tuition term is ten months.

The Jesuit Fathers, who own the largest private school property in the Territory, valued at $40,000, began their educational work in 1875.

The De La Salle Institute, established in 1888 by the Christian Brothers, accommodates over 100 pupils, the school session ranging over a period of ten months. The property of the institute is valued at $10,000.

The Woman's Home Missionary Society of the Methodist Episcopal Church supports a training school for girls and women. They are taught sewing and housekeeping and the elements of an English education. The school has accomplished a grand mission in teaching natives American ways, language, and ideas, and the workings of the Government of the United States.

All of the above-mentioned five sectarian schools are located in Las Vegas, and the worth of the property will aggregate over $100,000.

The public schools of Las Vegas and East Las Vegas are a source of great satisfaction to the residents of the city and county and they compare favorably with the best public schools in Eastern communities. Las Vegas is an incorporated city and has but one school district, under the management of a board of trustees. Las Vegas proper, which recently by popular vote decided to incorporate, has two school districts, whose destinies are looked after by various school directors. The directors availed themselves of the law of 1890 and voted school bonds for the erection of more school buildings, each district now having a three-story white sandstone edifice adequate to accommodate a city of twice the population of Las Vegas and handsome enough to grace any community in the United States. The buildings cost $12,000 and $14,500, respectively. The average enrollment of pupils is 300.

The city of Las Vegas possesses the distinction of being the first community in New Mexico to erect a public school building by a special tax voted by the people. In 1889 the town council, in the absence of a law permitting the issue of bonds by school districts, built a schoolhouse under the general law permitting incorporated towns to issue bonds for public buildings. The schoolhouse was originally erected of white sandstone at a cost of $14,500, and during the past year it has been enlarged commensurate with the needs of the city, and the value of the property enhanced fully $10,000. In 1891 the school opened with an enrollment of 250 pupils and a faculty of 5, since which time it has grown until the enrollment of pupils is now over 700 and the faculty increased to 12. This building now accommodates the first, second, fourth, and fifth grades, the sixth, seventh, and eighth grades and the high school being taught in the new building recently erected for high school purposes. This building was completed and first occupied in September, 1902, the cost of erection being $25,000. It is constructed of brown sandstone, in the baronial style,

and its size and beauty have received the favorable comment of many visitors. These school buildings offer ample accommodations to all children of the city. The course of study in the high school is of four years' duration. Pupils from it have entered corresponding grades in high schools in the East, often obtaining advanced standing.

During the past seven years the high school has graduated with distinction 60 young men and women of the city. Recently the high school was amalgamated with the academic department of the New Mexico Normal University, the latter getting six model schools of different grades, and leaving the high school confined to the first eight grades.

The New Mexico Normal University, which commands an eminence in the center of the city of Las Vegas, is a source of great pride to the Territory as well as the city. It was created by legislative act in 1893 as a normal school, and has since attained the dignity of a university by reason of its superior faculty and because of the earnest efforts put forth in behalf of the institution by the board of regents. For a period of four years the regents wisely husbanded the accumulating funds and were finally enabled, with the assistance of a number of public-spirited citizens, to erect a building at a cost of $50,000, which is in every way adapted to the purposes designed. The university building is conceded to be the most beautiful public building in the Territory. It is a three-story structure, built of purple sandstone produced by the Las Vegas quarries, and above the third story is a commodious attic, divided into two large and amply lighted rooms, which will be utilized for a museum and gymnasium. The assembly room of the university has a seating capacity of 400 and the institution has equipment and room for the accommodation of 400 pupils. As to furnishings, the building is fitted with every known modern convenience, being heated by steam and scientifically ventilated. Elec tric lights, an excellent water system, and sanitary plumbing insure ideal conditions for the school. The institution is served with a faculty of 6 professors and 6 teachers.

To summarize, San Miguel County possesses 80 district schools, 3 private schools, 4 sectarian schools, and 6 public schools, with a total enrollment of 4,500; 130 teachers, and $250,000 invested in school properties.

Persons having children to educate and who contemplate coming to this region for health or investment need have no fear that inferior advantages will be provided. The legal school age is from 5 to 21 years, inclusive, but the average attendance is practically from 7 to 17.

COUNTY GUIDE.

Following are the names of some of the settlements given by the United States Postal Guide, the resources of the county contiguous to the settlements, the population within a radius of 5 miles, and the distance from the city of Las Vegas—a description of Las Vegas being given under the head of "Cities and towns of New Mexico:"

Bellranch: Post-office at the ranch of the Red River Valley Company. Sixty-five miles east of Las Vegas. On Pablo Montoya land grant. Topography, plains, with some rough country. Well watered. An ideal stock country.

Beulah: A small village at the head of Sapello River. Twenty miles northwest of Las Vegas. On the Pecos reserve. Resources, agriculture, timber, and stock raising. Population, 50 families.

Chapelle: Railway station on the Atchison, Topeka and Santa Fe Railway. Thirteen miles southwest of Las Vegas. Resources, timber and grazing. Stock yards located here. Population, 100 families. Many prosperous tributary hamlets.

Chaperito: Located on the Gallinas River. Thirty miles southwest of Las Vegas. On Antonio Ortiz grant. Resources, stock raising and farming. Population, 373. Three stores.

El Pueblo: Located on the Pecos River. Thirty-five miles southwest of Las Vegas. Resources, stock growing and agriculture. Population, 300.

Fulton: Railway station on the Atchison, Topeka and Santa Fe Railway. Forty miles west of Las Vegas. Resources, stock growing and farming. Many small villages near by.

Gallinas Springs: Located on the Santa Rosa wagon road. Twenty-five miles south of Las Vegas. Resources, stock growing and farming. Population, 400.

Geronimo: Located 15 miles due west of Las Vegas. Resources, stock raising and farming. Population, 536.

Las Vegas Hot Springs: Famous health resort, located 6 miles northwest of Las Vegas. Population, 244. Floating population, 500. (See description further along.)

Los Alamos: Settlement in beautiful Sapello Canyon, 10 miles northeast of Las Vegas. Resources, stock raising and farming. Especially adapted to raising sheep and goats. Population, 373.

Pecos: On the Pecos River, 50 miles southwest of Las Vegas. The precinct is one of the largest in the county, and has a population of 536. Resources, stock growing and farming.

El Porvenir: Health and pleasure resort in Gallinas Canyon, at the foot of Hermits Peak. Eighteen miles northwest of Las Vegas. Population, 200. One of the most beautiful scenic resorts in the West.

Rivera: Station on Atchison, Topeka and Santa Fe Railway, 30 miles west of Las Vegas. Resources, farming and stock raising.

Rociada: Located 35 miles northwest of Las Vegas. A coming mining district. Some farming and sheep raising. Population, 298.

Rowe: Station on the Atchison, Topeka and Santa Fe Railway, 40 miles from Las Vegas. Resources, timber, agriculture, and stock raising. Population, 391.

San Ignacio: Located 18 miles northwest of Las Vegas. Noted as a summer resort. Chief industry is lumbering. Sawmills located here. In the Rociada mining district. Population, 300.

San Miguel: Located 30 miles southwest of Las Vegas. Splendid agricultural and stock country. Was the county seat of San Miguel County in the early sixties. Population, 450.

Sapello: Located 12 miles northwest of Las Vegas, on the Mora wagon road. Excellent agricultural and stock country. Flour mill located here. Population, 351.

Sena: On Pecos River, 35 miles southwest of Las Vegas. Resources, agriculture and stock raising.

Tecolote: Located 12 miles south of Las Vegas. Resources, agriculture and stock growing. Population, 227.

Villanueva: On the Pecos River, 38 miles southwest of Las Vegas. Resources, agriculture and stock raising.

In nearly all of the above districts fruit growing is carried on to some extent.

AGRICULTURAL RESOURCES.

Nowhere in the Territory have the agricultural resources greater possibilities than here. In many sections of the county crop raising without irrigation is perfectly feasible, and, in other portions where the dip of the land is such that irrigation must be adopted, the application of water is a comparatively easy task because of the abundance of the innumerable waterways which drain the county.

Relative to the agricultural conditions of the county, Capt. W. C. Reid states:

The greatest of all needs of San Miguel County is farmers. Of merchants, lawyers, doctors, politicians, middlemen, statesmen, etc., the supply is fully equal to the present demand; but the farmer, the basis of development and the foundation stone and superstructure of all public prosperity—individual, local, State, and national—the man who tills the soil in rational, intelligent, and successful ways is the man needed here.

The native population of the county are natural sheep men and cattlemen, and devote all their attention to these profitable industries. In many instances they have their homes located in rich valleys, capable of producing large and paying crops, but at the same time import their corn and flour from the Middle States.

In San Miguel County there are valleys with ample water, if intelligently used, to supply with wheat, oats, corn, and hay, a population of 200,000 people; yet, for a lack of farmers, there are on an average of 12 carloads of flour, 3 of corn, and 5 of oats shipped into the county per month the year round. This is the natural result of the condition of our industries. The cattle and sheep men are not producers of hay, grain, and fruits, nor do they even raise garden truck, but they buy oats by the ton, and they buy bacon, garden products, and fruit. The miners who delve for coal, copper, silver, and gold are many, and they buy imported products at good prices.

The observations of Captain Reid are, unfortunately, too true, and the condition is slow in changing, for the tide of immigration does not flow so swiftly toward New Mexico as it does toward the blizzard-stricken Dakotas and the sun-baked Kansas. And yet it has been repeatedly demonstrated that agriculture on almost any scale will pay handsome returns. The Gallinas Canal and Water Storage and Irrigation Company, capitalized for $10,000, furnishes a startling object lesson of the feasibility of reclaiming land by simple irrigation methods. A main ditch is conducted 3 miles out from the Gallinas River, supplying a natural reservoir covering 34 acres of ground. From this reservoir, by ditches and laterals, water is conveyed to the several farms lining the system, each having a private reservoir, which is fed from the river in the flood season, and which is capable of irrigating its respective tract two or three times during the dry season. Under this system about 1,500 acres of waterless uplands have been reclaimed for agriculture. The farms watered in this manner adjoin the city of Las Vegas and vary in size from 12 to 450 acres, the small tracts being sufficient to supply the needs of small families.

A few miles north of town is a large basin, about 30 miles in circumference, into which can be emptied the flood waters of two rivers, together with the drainage of an immense watershed, and from which, by the construction of proper dams and canals, water may be conveyed upon at least 50,000 acres of productive land. Under the irrigation law passed by the last Congress the Department of the Interior will have the power and the means to build an immense reservoir to conserve the flood waters in this basin. W. M. Reed, of the United States Geological Survey, under instructions from Professor Newell, chief engineer, has examined this site and reported favorably on the same, and has been ordered to make necessary preliminary surveys preparatory to the construction of an immense reservoir under Government supervision. This will result in bringing 5,000 to 10,000 acres of fine land under the plow, which will be sold in lots of possibly 80 acres for extensive farming and will doubtless bring a considerable addition to the population of the county and of the city of Las Vegas. Experiments made on the suitability of this climate for growing corn bring the following results: Australian, white flint, 60 bushels to the acre; Leaming, yellow dent, 55 bushels; King Philip, red flint, 50 bushels; Longfellow, yellow flint, 55 bushels; Angel of Midnight, yellow flint, 60 bushels.

Alfalfa yields three cuttings per season, aggregating about 5 tons. The average value of the product is $10 per ton. After thorough seeding it lasts indefinitely, the root nodules of the plant constantly enriching the soil by supplying necessary oxygen.

Experiments made in vegetable raising have been prolific of as good results as those of producing grain. One year's crop of vegetables

on less than 6 acres of ground resulted in 11,183 pounds of beets, 46,537 pounds of cabbage, 2,960 pounds of carrots, 2,800 pounds of parsnips, 2,226 pounds of onions, 1,022 pounds of cauliflower, 1,049 pounds of turnips, 184 pounds of string beans, 936 pounds of cucumbers, 10 pounds of lettuce, 21 pounds of Javas, 40 pounds of green peas, 600 roasting ears of corn, 100 pounds of rhubarb, 600 pounds of celery, 26 pounds of beans, 2,186 pounds of corn in the ear, 3,000 pounds of oats in sheaves, and 5,600 pounds of shock fodder, a total of 81,800 pounds of product, valued at $2,050. This from 6 acres of ground which a short time previously had been a barren hillside.

Beets weighing 14 pounds, cabbages 36, and turnips 4 were common features of the crop. From 1 ounce of seed 1,000 pounds of sugar beets were raised. Celery weighing 4 pounds to the stock, and a dozen bunches weighing as much as 5 dozen bunches of the Kalamazoo product, 4 cabbages which weighed 137 pounds, 2 more that weighed 75 pounds, and sugar beets planted June 1 and tested in January, which gave 15 per cent of sugar and 84.7 purity, were the results of another practical gardener's experiments. Potatoes in the higher mountain valleys give, without irrigation, a yield unexcelled in quality, size, and quantity by any country in the world.

As an evidence of the remunerative features of farming and gardening in this county, it may be said that eastern prices, with a high freight rate added, prevail, for the reason that the home products have never been sufficient to make any impression on the market, and as there is no competition freight and express rates are maintained as high as possible. Nearly all of the poultry and eggs used in the county are imported. The price for eggs is 30 cents per dozen, and home ranch eggs even command a higher price. This rate is maintained the year round, for there is no diminution of the demand. Everything possible for the farmer to grow commands one-third more than the same product in the east, and the market exists at home for all that can be produced.

BUILDING STONE.

San Miguel County has long been noted for the excellence and beauty of its building stone, many public buildings in the Territory being monuments to its superiority over other stone.

The blue limestone and white sandstone are used in rubble work, and the latter, ground, would manufacture into a fine glass, as declared by experts.

For dimension cutting an excellent quality of brown stone is produced which would serve as a substitute for granite. The stone will stand every chemical test. Both the brown and white sandstone are adapted to bas-relief work, for it is hard and works up well.

The stone is very accessible, great ledges being exposed in the mountain canyons, and the cost of quarrying can be reduced to almost nothing. With additional railway connections, Las Vegas promises to become a great producer and shipper of fine stone.

THE MINING INTERESTS.

The mineral wealth of the county embraces deposits of gold, silver, lead, copper, tin, aluminum, mica, coal, iron, zinc, alum, gypsum, fire clays, and marble. Of the base metals vast deposits are shown.

Very little systematic prospecting has been done in the county, but as rich deposits have been opening in the same mountain range both north and south of the county, it is only a question of time until those of San Miguel will be exploited.

Within 12 miles of Las Vegas, in what is known as the Tecolote district, enormous bodies of copper bearing sandstone have been discovered and opened, carrying the carbonates of copper both malachite and azurite, and yielding upon treatment by the leaching process from 2 to 9 per cent copper; also limited values in gold and silver. The district embraces about 100 square miles. Perhaps nowhere else in the world is found a like mineralogical condition, the entire body of sandstone being more or less impregnated with carbonates of copper. It is easily mined and cheaply reduced by the leaching process, 4 per cent ore yielding large profits. The San Miguel Copper Company is erecting a 100-ton mill on the west side of the Tecolote stream, and the Tecolote Company has completed a 25-ton plant on the east bank. In the city of Las Vegas, Messrox Standish & Matt are completing a 50-ton mill for the reduction of the ores both from the Tecolote and Rociada districts. In the latter district a large amount of development work has been done during the past year with satisfactory results.

LUMBERING AND LOGGING.

San Miguel County and sections contiguous on the north and west are the most densely timbered portions of New Mexico. Forests of yellow and white pine cover the mountain slopes, furnishing an abundance of timber for excellent lumber. The products of these forests are used extensively in interior finishing work and with satisfaction.

Spruce, oak, walnut, cedar, and pine abound, supplying bridge timbers, piling, ties, poles, beams, and all other kinds of heavy timbers. The treeless plains to the east, south, and southwest make of Las Vegas the lumber market of New Mexico. The wood-preserving works of the Atchison, Topeka and Santa Fe Railway are located here.

Near the city are 11 sawmills, and yet the timber supply has barely been touched. The tributaries of the upper Pecos, Tecolote, and Gallinas streams, the mesas west of La Cuesta, and along Canyon Blanco, and the headwaters of the Sapello and side canyons have millions of feet of fine saw timber and red spruce. Nearly all of the timber is located on government land.

RAILROAD DEVELOPMENT.

The Atchison, Topeka and Santa Fe Railway Company has invested nearly $2,000,000 in and around the city of Las Vegas; it disburses $50,000 monthly in the community, and supports nearly 2,000 persons.

The building of the El Paso–Rock Island Railway, cutting through the extreme end of the county, has led to the building of the Dawson Railway into Las Vegas on its way to the Dawson coal fields, which were recently acquired by that company, in Colfax County, about 40 miles of the Dawson Railway being in San Miguel County.

The building of the Denver Short Line from El Paso to Denver, via Las Vegas and Trinidad, is also being agitated by financiers of Las Vegas and St. Louis, and there is every hope that the plans may materialize at no distant date; and the extension of the Las Vegas Hot

Springs Electric Railway, now running through the city to the celebrated Las Vegas Hot Springs, 6 miles distant, to Mora, 30 miles fiistant, via Sapello, Rociada, and other points, and to the far-famed dshing grounds at Rio de la Casa, is also under the consideration of these capitalists.

The Texas Central Railway is still pushing on toward the north, with Las Vegas as a probable terminus.

The Las Vegas, Mora and Taos Railway, projected some years ago by Robert L. M. Ross, F. A. Manzanares, and others, is now the subject of discussion and action on the part of the Las Vegas Board of Trade, and there is hardly a doubt but that work will soon be started on this important line. The intention is to build the line from Las Vegas to Taos, via Mora, and seek a northern connection with the Rio Grande Railway.

The Atchison, Topeka and Santa Fe Railway system maintains a branch railway from Las Vegas to Las Vegas Hot Springs, a distance of 6 miles, which at present is under lease to and used by the Las Vegas and Hot Springs Electric Street Railway, operated by the Las Vegas Electric Railway Light and Power Company, which has already expended over $100,000 in changing the Hot Springs line to a trolley road, and which is planning an immediate extension of its lines to cover all the principal streets of Las Vegas. At the springs the company has spent nearly $1,000,000 in creating a summer resort, and erecting a hotel, bath houses, etc. It has the reputation of being the finest resort between Chicago and San Francisco.

THE CLIMATE.

The latitude of San Miguel County is about the same as that of central Tennessee, while the altitude averages 6,500 feet. This combination gives a peculiar but most happy result. In the winter during the day the thermometer seldom falls in the shade below 40°, while it often runs in the sunshine to 65°, or even more. On the other hand, in the summer the heat is never oppressive in the shade, and no night is too warm for comfortable sleep under one or two blankets. This, with the extreme dryness of the air, caused by the very slight precipitation of moisture; the resinous aroma rolling down from the pine-clad mountains; the large amount of electricity in the air, and the consequent ozone resulting from the altitude, and the location of the town, landlocked by mountain and mesa—these all conspire to produce an atmosphere which is a balm to all diseases of the respiratory organs. The percentage of death from consumption is lower in New Mexico than it is anywhere else in the United States, and no other place in New Mexico excels Las Vegas in the salubrity of its climate. Asthmatics experience immediate and permanent relief in this altitude.

The following comparative table, taken from the reports of the United States Weather Bureau, shows the remarkable similarity in climatological conditions existing at Las Vegas and at Fort Stanton, N. Mex., where the Government maintains at great expense a splendid and effective sanitarium for the Marine-Hospital Service for the treatment of tuberculosis. It proves succinctly that Las Vegas and Fort Stanton are in the same class as far as climatological advantages are concerned. The argument from this table is that Las Vegas offers equal and socially most superior advantages to health seekers. There

is also appended to the table a convenient reference synopsis of the principal industries of Las Vegas, which has been issued by the board of trade.

	Fort Stanton, near El Paso and Northeastern Railway.	Las Vegas, on Atchison, Topeka and Santa Fe Railway.
Elevation ..... feet..	6,151	6,384
Mean monthly temperature for 1902:		
January	36.6	33.2
February	38.5	37.6
March	40.5	38.1
April	53.2	53.4
May	57.8	58.3
June	70.8	71.2
July	66.7	68.6
August	68.2	69.6
September	60.6	61.0
October	52.5	51.6
November	40.7	40.2
December	36.6	32.7
Mean annual temperature	51.9	51.7

	Apr. 30–Sept. 26.	Apr. 26–Oct. 3.
Clear days	279	286
Partly cloudy days	53	64
Cloudy days	33	15
Rainy days	45	53
Prevailing direction of wind	West.	West.
Precipitation ..... inches..	9.94	9.78
Snowfall ..... do....	11.2	15.5

Population of Las Vegas and suburbs, 9,000; mountain snow-water supply; magnificent school system, 10 schools; 4 banks (2 national), $1,400,000 deposits; 6 newspapers (1 daily); 23 secret and fraternal organizations; 8 miles of electric street railway; 3 building and loan associations; 1 public library and free reading room; $10,000 Carnegie Library; 12 churches; board of trade; 1 opera house; 5 wool-scouring mills; 2 lumber yards; 1 candy factory; 3 cigar factories; 1 copper smelter; 4 sanatoria; 1 hospital; 6 public halls; 2 flour mills; 1 brewery; 1 brickyard; 2 planing mills; 2 ice plants; stone yard, with stone crusher; 10 hotels and restaurants; 1 foundry and machine shop; 4 wholesale liquor houses; 3 carriage and wagon manufacturers; 4 wholesale groceries and implement houses; 4 jobbing houses (general merchandise); 2 telephone systems and electric plants; lixiviating mill for treatment of copper and other ores.

RESORTS.

In the way of health and pleasure resorts Las Vegas is unrivaled. In a radius of 20 miles, in romantic mountain glens and beside babbling mountain brooks, are the Las Vegas Hot Springs, Harvey's, El Porvenir, Blake's, Sparks's, Sapello, Rociada, and other places too numerous to mention, where health can be recovered, and life becomes a pleasure to the ennuye, the invalid, the overworked business man.

The Las Vegas Hot Springs are located six miles from town, and are connected with the city by rail and furnish hotel accommodations not surpassed in the United States. The Montezuma Hotel, owned by the Atchison, Topeka and Santa Fe Railroad Company, is a palatial fire-proof structure of red sandstone and iron, Queen Ann style, with several hundred rooms, and erected at a cost of $250,000. It is thoroughly and luxuriously furnished, lighted by electricity and heated by steam, and with every table delicacy of the East and West. The

other buildings are numerous, consisting of cottages and annexes, bath houses, hospital, post office, casino, station house, schoolhouse, telegraph and express offices, livery barn, etc. There is also the Mountain House, with sun parlor attached, a substantial stone structure of 60 rooms. The park and grounds cover 500 acres, while the veranda, on three sides of the Montezuma, is 540 feet long and 15 feet wide. It is positively asserted that no place in the United States equals the Montezuma property for the establishment of a Government military or naval sanitarium for invalid soldiers returning from the Tropic island possessions. The buildings, the grounds, the localities, and the climate are incomparable.

El Porvenir, a charmingly situated resort, has an elevation of 7,600 feet, and is reached from Las Vegas by a drive of 16 miles, 10 of which lie through the Gallinas Canyon, every turn of which unfolds a new scene of inspiring beauty and grandeur. Hermit's Peak rears its rugged head near by, the two hours' climb to the summit revealing a panorama of mountain, canyon, and plain unequalled even in this section. Excellent hunting and fishing can be had near the hotel, while the deep unruffled blue of the sky, the dry, invigorating air, the primeval pine forests with their balsamic odors and ceaseless sounds, unite to make an ideal resort.

Pleasure and health seekers are cared for in cottages and tents if desired. A movement is on foot to rebuild the hotel which was recently burned down. Harvey's Mountain Home is probably the highest cultivated point in this county, having an altitude of 10,000 feet. This makes it an unsurpassed resort for summer visitors, whom Mr. Harvey conveys to and from the city, arriving each Friday and leaving on Saturday. Every comfort of country life is produced on this ranch, while the visitor can fish or hunt turkey, deer, bear, mountain lion, wolves, and other game to his or her heart's content.

In addition to the resorts above described may be mentioned Buena Vista ranch, 4 miles from Las Vegas; Trout Springs, 10 miles; Mineral Hill, 20 miles; Sandoval's summer resort, 16 miles; J. Y. Lujan's, 12 miles; Heinlin's, Barber's, and Blake's, three excellent places near Rociada—these and many others furnish sufficient changes to occupy summer and fall without the visitor ever becoming weary. Places to visit or camp, convenient to the city, are Hermits Peak, Gallinas Canyon, Kearneys Gap, Wild Cat Peak, Lower Gallinas Canyon, Bonito Canyon, Las Villes, and the summit of the range, where snow always lies and the view sweeps over New Mexico into Colorado, Arizona, and Texas. The Pecos National Park, set apart by the Government to be preserved in a state of nature, is of easy access from this city, and when once seen will never be forgotten.

A NATURAL SANITARIUM.

Las Vegas is the natural sanitarium of the United States, combining more natural advantages than any other place in America. Its thermal waters are the equal of the Hot Springs of Arkansas, while its climate is infinitely superior. There is no malaria, no excessive heat or cold, no gnats nor mosquitoes, no tarantulas, no spiders, no toads, no snakes, nor rats. The air is pure, dry, rarified, and highly electrified—a certain cure for consumption, if taken in time. The hot waters are a specific for liver, skin, rheumatic, and blood disorders.

Thermometric readings here must not be confused with similar degrees in humid climes. Recent actual comparisons showed prostrations from the heat at Baltimore, Md., and other eastern places with the thermometer at 94°, while on the same day, coincidentally, the thermometer reached a maximum of 94° at Las Vegas, but here the air was light, cool in the shade, and bracing. Cover is essential every night in the year. July, August, and September, hot months in the eastern and southern States, are ideal here in health and comfort.

While "good roads" conventions were being held all over the United States, the legislature of New Mexico was passing a law providing for the building, with convict labor, of a roadway and pike over the mountains and through the beautiful Pecos River Forest Reserve, 42 miles in length, around Hermits Peak, across the Pecos River, through primeval forests, down the Santa Fe Canyon to the capital city of the Territory. When finished this will be one of the grandest scenic routes in the world.

Total indebtedness of San Miguel County.

Date of issue.	For what issued.	Due.	Interest.	Amount.
		Years.	*Per cent.*	
Nov. 1, 1895	Court-house and jail refunding	30	5½	$96,400.00
July 1, 1896	Funding bonds	30	5½	16,900.00
July 1, 1897	Bonds for city certificates	30	6	4,600.00
Aug. 2, 1897	Bonds, Bateman law	30	6	800.00
Mar. 1, 1900	Funding bonds	30	4	37,700.00
July 1, 1902	.....do	30	5	351,500.00
	Approved accounts	.....	.....	2,500.00
	Total	.....	.....	510,400.00

SANTA FE COUNTY.

Area, 2,160 square miles. Population, census of 1900, 14,658; census of 1890, 13,562; since the taking of the census the county has given Espanola and Moriarty precincts to other counties; its present population is 18,000. Assessed valuation, $2,468,790. County seat, Santa Fe.

County officials.—County commissioners, Arthur Seligman, A. L. Kendall, N. Quintana; probate judge, Marcos Castillo; probate clerk, Celso Lopez; sheriff, H. C. Kinsell; assessor, Marcelino A. Ortiz; treasurer, George W. Knaebel; superintendent of schools, John V. Conway; surveyor, Arthur J. Griffin.

Newspapers.—The Santa Fe Daily New Mexican; the New Mexican Review, an English weekly; El Nuevo Mexicano, a Spanish weekly; El Boletin Popular, a Spanish weekly, Santa Fe.

Post-offices.—Santa Fe, Glorieta, Cerrillos, Golden, Kennedy, Madrid, San Pedro, Chimayo, Hobart, Ildefonzo, Nambe, Pojuaque, Santa Cruz, Lamy, Cowspring, Galisteo.

The county of Santa Fe does not occupy as conspicuously large a place as many of the other counties of New Mexico, but owing to the history of its political capital, whence it derives its name, its scenic and climatic attractions, and its diversified resources, it naturally takes first rank in interest among the political subdivisions of the Territory.

It is the central county of the Territory; is rectangular in form, extending south a distance of 72 miles from the thirty-sixth degree of latitude, and measures 30 miles from east to west; embraces a total area of 2,160 square miles, being twice as large as Rhode Island and 200 square miles larger than the State of Delaware. Of this area 950,000 acres are officially pronounced available for cultivation and pasturage, while thousands of the roughest mountain acres are clothed with timber and ribbed with valuable mineral-bearing veins. Excepting Bernalillo County, it is the smallest county in the Territory. It is crossed from east to west by the great transcontinental railroad of the Atchison, Topeka and Santa Fe System, which operates over 70 miles of road within its borders, and is tapped from the north by the New Mexico division of the Denver and Rio Grande Railroad, which extends within the county from Espanola to Sante Fe, a distance of 38 miles. The Santa Fe Central Railway has its terminal at Santa Fe, giving the capital direct connection with the Chicago, Rock Island and Pacific System. The length of its main line in the county is 65 miles. A branch line of 42.6 miles will be built from Moriarty to Albuquerque. The main line was completed August 15, 1903, and the branches mentioned are to be built by June 30, 1904. A branch line of the Santa Fe System runs from Lamy to Santa Fe, a distance of 18 miles. A short branch line of the main line also extends to the Madrid coal fields. Excellent wagon roads reach all the towns in the county, and a telephone line runs from Santa Fe to Cerrillos.

From the summit of Mount Baldy the surface of the county presents a magnificent panorama of mountains, mesas, and valleys, with numerous streams of water rushing down high mountain shoulders, over precipices and bowlders, into deep and narrow gorges and widening valleys, flashing in the sunlight like ribbons of silver in their hurried and heedless race to the Rio Grande on the west, and with the lofty mountain peaks of southern and northern New Mexico swimming in the blue air of the dreamy distance. The main range of the Rockies, or the Sangre de Cristo range on the east, and the Valles and Jemez mountains beyond the Rio Grande on the west shelter this favored locality from violent winds and render the climate remarkably mild and equable considering that the altitude of the valleys varies from 5,500 to 7,500 feet above sea level. Doubtless this circumstance, together with the fertility of the soil, excellence of the water, plenitude of timber, and the many marked manifestations of rich veins and deposits of gold and silver bearing mineral a few miles south, prompted the intrepid Spanish explorers to locate a permanent colony and mission at Santa Fe, or the City of the Holy Faith of St. Francis, as early as 1605.

The wisdom of this selection has been abundantly demonstrated during nearly four centuries that have since melted into the past. With the exception of the twelve years following the bloody and transiently successful revolt of the Pueblo Indians in 1680, Santa Fe has ever since been recognized as one of the most important outposts of civilization and commerce in the southwestern country, being continuously the political, ecclesiastical, and military capital of this region under both Spanish and Mexican rule, and though it has seen the frontier line of the United States carried thousands of miles out into the Pacific Ocean, it still maintains its supremacy as the capital city of New Mexico, the county seat of Santa Fe county, and the most delightful residence city in the Rocky Mountains.

MATERIAL RESOURCES.

The assessed valuation of the real and personal property for the year 1903, excluding the large amount exempt from taxation under the law, reaches $2,207,842, while the real value is probably several times as much. There are about 500,000 acres of public land subject to entry under the homestead and desert land laws, and 557,880 acres more are included in Spanish and Mexican grants, which are purchasable at low rates and on easy terms. During the fiscal year ending June 30, 1903, homesteaders entered upon 5,597.86 acres in the county. It may be added further that the county affords about 470,000 acres of good grazing land, partly covered with timber, and about 500,000 acres of areable land, 200,000 acres of which could be irrigated. In the absence of exact data, the land actually under cultivation by means of irrigation is conservatively estimated at 10,000 acres, while 10,000 acres more are yearly planted to crops subject to chances of enough rain in the growing season to mature them. Wherever the valley and mesa lands have been brought under the magic influence of systematic irrigation the results have uniformly proved more satisfactory, and naturally this stimulates enterprise annually to enlarge and extend existing irrigation systems and thus gradually increase the number of acres that can be depended upon to yield regular crops.

This is notably true of the Espanola Valley, in the northern part of the county. Plentifully watered by the Rio Grande and its tributaries, the Chama, Santa Clara, and Santa Cruz, this beautiful valley is now mostly under cultivation, and evidences of contentment and prosperity are noted on every hand. The acreage of wheat, corn, oats, beans, and kindred crops increases every year. Alfalfa yields three, and sometimes four crops per year. Sugar beets, carrying a very high per cent of saccharine matter, can be readily grown there. Numerous orchards of apple, peach, pear, plum, prune, cherry, apricot, and nectarine trees have for several years furnished the choicest of fruits, and their thrifty and vigorous appearance gives promise of multiplying profits in the future. All kinds of small fruit, including strawberries, raspberries, and currants, flourish. Many extensive vegetable gardens, where lettuce, radishes, onions, asparagus, green peas, sweet peas, sweet corn, beets, tomatoes, celery, parsnips, and other edibles are raised in great profusion and perfection, for the markets of northern New Mexico and southern Colorado have not only proved to be constant bread winners, but surplus producers. So far as productive qualities are concerned, these remarks may be applied to nearly all of the irrigable and arable lands of the county, particularly the Espanola, Santa Fe, Tesuque, Santa Cruz, and Nambe valleys.

The distinguished and lamented Archbishop John B. Lamy introduced the culture of choice fruits, flowers, and vegetables into Santa Fe and elsewhere in New Mexico about fifty years ago. The good man lived long enough to witness the complete success of his experiment and personally taste the rare flavor of its luscious results. It was soon found that all the most desirable varieties of temperate zone fruits, including the largest and finest flavored French cherries, could be grown here in perfection and in quantities only limited by the extent of land and available water supply; that the soil and sunshine of Santa Fe would produce roses rivaling those of France and Italy in beauty and fragrance, and that the conditions were peculiarly favorable to the cultivation of all kinds of vegetables. It thus happens that the orchards and gardens in and about the capital city are not only veritable garden spots, either when blushing with sweet prophecies of better things to come or burdened with mature and mellow fruitage, but provide many families with the comforts of life. Some of these orchards and gardens are irrigated from ancient acequias taken out of the Rio Santa Fe, and others are watered direct from the mains of the local water company.

POSSIBILITIES OF IRRIGATION.

The extent of land so far devoted to the twain arts of agriculture and horticulture is comparatively small because the natural flow of water in the mountain streams is not sufficient during dry seasons to justify taking out much longer or larger irrigating ditches. These streams carry immense volumes of flood water during the months of February, March, and April, when the snow is melting in the high altitudes and the spring rains are in progress, and again become rushing torrents during the heavy rains of July and August; but coming from precipitous heights and pouring into expanding valleys and plains below, their invaluable surplus is soon absorbed by the porous soil or taken

THE NAMBE FALLS NEAR SANTA FE, LOCATED RECENTLY FOR A POWER SITE

up by the thirsty air. So, during the months of May and June, when most needed for irrigating purposes, the supply of water is smallest. The remedy is obvious. Wisely located storage reservoirs, like those in southern California or in southeastern New Mexico, capable of holding until needed the flood waters of winter, spring, and midsummer, would render it possible to reclaim and make fruitful thousands of acres of as good land as any now under cultivation in the county.

Careful observations in the canyon show that the Santa Fe River has a flow of 80 acre-feet per day during the months of February, March, and April; that the rainfall in Santa Fe during July and August varies from 2.50 to 6.25 inches, while in the mountains and canyons composing the watershed of the river and embracing an area of over 100 square miles, the rainfall during these two months is not less than 10 inches; that the rainfall in September sometimes amounts to nearly 3 inches; and that after the irrigation season closes, or during the months of November, December, and January there is always surplus water. In the light of these facts, after making liberal deductions for evaporation and seepage, competent hydraulic engineers reach the conclusion that the storage of the flood or waste waters of the Santa Fe would reclaim and render valuable from 20,000 to 25,000 acres that are now arid and practically worthless.

The Nambe, with numerous natural storage basins along its course, carries three or four times as much water as the Santa Fe, and hence is capable of reclaiming fully 60,000 acres. The Tesuque has about the same, and the Galisteo about half the flow of the Santa Fe. The reservoir and waterworks of the Santa Fe Water and Light Company, as well as the extensive ditches and laterals of the Espanola Valley, including a complete ditch system just constructed by the Government for the San Ildefonso pueblo, show that a beginning has been made in utilizing the waters of the streams for irrigation purposes. Owing to the great fall of these streams in their course they could also furnish ample and cheap power for industrial enterprises. In fact, on the Nambe, the Santa Fe Water and Light Company is about to build large power works to supply Santa Fe with electric power for industrial and lighting purposes, and on the Pecos the Capital Power and Light Company is doing the preliminary work for erecting a large power plant.

Next to the Rio Grande, one of its tributaries, the Santa Cruz, in the extreme northern part of the county, carries the largest volume of water. South of the Santa Cruz flows the Nambe and Pojoaque, into the Rio Grande. The Pojoaque has the Tesuque as a tributary. The Truchas and the Santa Clara carry but a small volume of water, but still sufficient to irrigate a considerable area if their flood waters are stored. The Santa Fe has a tributary called the Arroyo Hondo, on the headwaters of which several hundred acres are under cultivation and which at times carries a large amount of flood water.

The surplus waters of the nine streams named could be conveniently stored and distributed over the Santa Fe plains as needed, and it will be perceived that, without taking into account the Rio Grande, their combined capacity would be sufficient to reclaim over 100,000 acres in addition to the lands they are now watering. These lands can be secured under the provisions of the United States land laws, or on most favorable terms of private owners, and considering that their soil is as fertile and easily tilled and only requires water to become as fruitful as lands in the Espanola Valley that annually yield excellent returns and

are held at from $30 to $300 per acre, the thoughtful reader will be able to form an approximate idea of the large direct and indirect benefits that would be derived from the proposed system of storage reservoirs. It would not only richly reward the capital and energy invested in constructive work, but would prove a blessing to many deserving men by affording them much coveted opportunities to gain good homes and comfortable incomes in this almost ideal climate. Ten intensely and intelligently cultivated acres, one-half planted to the varieties of fruits that flourish so well at Santa Fe and in the Espanola and Tesuque valleys, and the other half devoted to the culture of vegetables, would furnish ample occupation and support for a family. The small fruits and vegetables would pay well from the very start, while the trees would begin to bear in from five to eight years. Celery of superior quality, possessing in a high degree the delicious nutty flavor so much prized by epicures, readily grows here, and might be made a source of large and constant profit. Asparagus, cabbage, cauliflower, onions, oyster plant, and parsnips would reward industry. Experiments prove that sugar beets, grading higher in sugar content than those of California and Colorado, can be grown here, and they will no doubt be raised on a large scale as soon as the eyes of the capitalist are opened to the wisdom of erecting factories in this section for their reduction. Alfalfa, wheat, oats, and corn pay handsomely. Irrigated lands are unfailing crop producers.

The rapid and successful development of near-by mining districts, with the certainty that the number of consumers there will soon be multiplied to thousands, guarantees the best possible market for all that these lands can produce. What an inviting field for the establishment of colonies. What tempting and unsurpassed opportunities are thus presented to the many invalids who are seeking and finding fresh health and vigor under the benign influences of the almost perpetual sunshine and the pure, dry, rarified air of a region over which skies of the softest blue tenderly bend, as if bestowing a special blessing.

According to the census of 1900, the number of farms in Santa Fe County is 918, of which 875 have buildings on them. Acreage in farms, 658,930; improved, 13,610; value of land and improvements without buildings, $1,679,024; buildings, $498,183; implements and machinery, $56,250; live stock, $548,557; products not fed to live stock, $320,348; labor, $66,490; fertilizers, $2,530; number of irrigators, 694; acres irrigated, 8,249; irrigation ditches, 93; length in miles, 107; cost of construction, $46,453; acres under ditch, 17,240; cost of water right per acre, $5.07; cost of annual maintenance, 21 cents.

In consequence of the large shipments of cattle and sheep during the past few years, the extensive areas of fine grazing land are not nearly as well stocked as they should be. According to the figures furnished by the cattle and sheep sanitary boards, and reliable estimates, the live stock in the county numbers and is classified as follows: Horses, 2,000; cattle, 10,000; sheep, 200,000; goats, 40,000; mules and burros, 1,500. Clearly this is an inviting field for stock growers.

THE MINING INDUSTRY.

In marked contrast with prolific orchards, fields, meadows, and gardens of the northern valleys and mesas, are the gold, silver, copper,

lead, zinc, and turquoise bearing mountains and hills about Cerrillos, Dolores, Golden, San Pedro, and Santa Fe, and the great anthracite and bituminous coal measures at Madrid and elsewhere in the southern portion and around Santa Fe. Unquestionably the gold found in these localities was one of the principal reasons why the Spaniards took such desperate chances to plant and maintain colonies in this section centuries ago. They extensively worked the old and new placers at Dolores and Golden two hundred and three hundred years ago, rescuing therefrom millions of dollars worth of gold, mainly by means of labor of enslaved Pueblo Indians and the rudest possible methods, even obtaining scanty supplies of water by melting snow with heated rocks; and their descendants are still working these inexhaustible deposits of pay gravel by means of "dry washers." Much of this gold is quite coarse. Years ago a nugget was found near Dolores that yielded about $400, and after heavy rains nuggets worth several dollars each are often picked up. Except for the absence of water the production of gold from these placers would be immense and continuous. Modern skill and enterprise have partly solved the problem by the agency of deep wells and powerful steam pumps, and can be relied upon finally to achieve success in much larger degree. Artesian well experiments have so far failed, but confidence is entertained that ultimately an artesian well flow will be secured. The lodes in the surrounding hills, whence the deposits undoubtedly crumbled and washed down, are of inestimable value. Indeed, the range of mountains extending from Dolores south about 8 miles is virtually one vast upheaval of mineralized matter. Cunningham and several other hills of the range are virtually mountains of ore of high enough grade to warrant the belief that the whole mass will be worked when the requisite facilities are introduced.

Some of these lodes were developed to the extent of several hundreds of feet many years ago, and there are evidences that much mineral was extracted. It is estimated that gold to the value of $5,000,000 was taken out of the old workings of the Ortiz mine. This mine is now being systematically worked by the Ortiz Gold Mining Company, of St. Louis, Mo., capitalized at $2,000,000, and its free milling output treated at a plant on the ground.

A shaft is down 425 feet and five levels have been run, respectively 500, 595, 375, 350, and 280 feet long, the third level being 150 feet below the surface, connecting with an old incline 425 feet long. The lowest level is 400 feet from the surface. A number of stopes have been opened, in addition to wings, upraises, crosscuts and air shafts, all of the work being in ore. The plant is modern and cost $75,000. In the same vicinity is the Benton mine, from one pocket of which $60,000 worth of ore was taken in a few months some years ago.

At Golden, a few miles south in the same range, are found numerous lodes of gold and silver bearing ore, as well as blanket deposits of lead and iron carbonates that carry both of the precious metals. Several of these lodes are undergoing systematic development, which promises rich results. Tests at small local plants prove that most of the ores will readily yield their values in Huntington mills.

Two miles farther south are the San Pedro copper mines, showing large bodies of copper ore which are treated at the smelter near by. Owing to litigation these mines were not worked for several years, but are now being operated under competent management, and both mining

and reduction facilities are being increased as rapidly as possible, a fine smelter having been completed only a short time ago.

Large bodies of silver-bearing lead and zinc ore have been opened near Cerrillos, but the low price of silver and other causes have prevented their being worked during recent years. The workings of the Cash Entry mine are very extensive, and it is understood that great bodies of ore are disclosed that would pay well at the present prices of silver and lead. These large bodies of iron, zinc, and lime are now in demand. A fine modern smelter occupies a prominent and desirable site at Cerrillos.

The Gibson Development Company is largely interested in the San Pedro and the Cerrillos districts, and is doing much to prove the values in these camps. On their Erie mine in the latter district they have taken out some high-grade ore.

At Turquesa, a few miles north of Cerrillos, are located the celebrated turquoise mines of the American Turquoise Company, from which thousands of dollars' worth of magnificent gems have been extracted and shipped to New York. Experts pronounce them superior in purity, luster, and enduring sky-blue color to any produced in the world, surpassing the turquoise of Persia in the exact tint desired. Garnets of rare beauty are also found in the county, and large deposits of marble, limestone, and fire clay of splendid quality exist in the immediate vicinity of Santa Fe.

Much prospecting is going on in the mountains near the capital city, and some fine specimens of gold, copper, iron, and mica have been brought in that indicate valuable ore bodies.

Several mining deals made recently show that the mining men and capitalists are beginning to pay attention to the mineral wealth in the Santa Fe Range. In the vicinity of Glorieta are also very large iron, coal, and copper deposits that are being worked. Near Nambe are valuable mica deposits that have been developed.

COAL MEASURES AT MADRID.

The Coal Measures at Madrid, just south of Cerrillos, show three distinct veins from 5 to 10 feet thick, extending for miles. The output of these veins is remarkably varied, including soft, free coking, noncoking bituminous, and semianthracite coal. The intimate association of bituminous and anthracite veins appearing in an alternate strata in the same mine is a phenomenon that deeply interests geologists. Purely practical people, however, are content with the knowledge that the veins contain enough coal for many generations to come, and that it is nearly all of superior quality. The mines are operated by the Colorado Fuel and Iron Company, whose tracks reach the workings, giving employment to several hundred men, and producing annually about 250,000 tons of coal worth $450,000. The company also operates a large coke-making plant near the mines, and finds a ready market for its product in Colorado, New Mexico, and Texas. A fine electric plant for the purpose of generating and transmitting power to operate the mines and mills in the Cochiti district is located at Madrid, where the vast accumulation of slack affords an unlimited quantity of cheap fuel.

Extensive coal beds also exist in other portions of southern Santa Fe County, as well as in the immediate vicinity of Santa Fe, and are being

quietly and steadily developed. This is especially the case in the O'Mara coal fields on the Santa Fe Central Railway and along the Albuquerque and Eastern Railroad.

THE CLIMATE.

In counting up the assets of Santa Fe County its peerless climate must of course be taken into account, for in many respects this is its greatest resource and attraction. It stands without peer among the counties of the United States in that respect. It is the ideal sanitarium for consumptives and invalids. Its high altitude, dryness of its atmosphere, the mildness of its winters, and the coolness of its summers make it a perfect summer and winter resort and a haven of refuge to those who seek health. In summer the temperature very seldom exceeds 80°, and a temperature of 100° is not on record during the twenty-nine years that the Weather Bureau has kept records at Santa Fe; but even a temperature of 100° would feel 10° to 20° cooler here than at New York or Boston on account of the low humidity of the atmosphere. During the night in summer there is always a fall from 20° to 30° in temperature, and it is very seldom, if ever at all, that the minimum temperature of any day exceeds 65°. In winter almost perpetual sunshine with but few cloudy days makes this section an ideal resort. The air is crisp enough to be bracing, but yet the mercury in the sunshine very seldom descends below the freezing point, and the winds are much less violent than in other parts of the Southwest.

Snow falls moderately and is absorbed by the ground and atmosphere generally within a short space of time.

Hundreds of people, not only here, but in all parts of the world, can testify to the healing qualities of the climate with its pine odor-laden air. Many miraculous cures stand to the credit of the climate, and there is no doubt that every case of incipient consumption, where the patient lives an outdoor life and observes the most obvious hygienic and dietetic rules, will be greatly benefited or eventually cured by it. And not only for consumption, but for many other diseases, is this county a sanitarium that brings health and the blush of roses back to the cheeks. It is a positive physical delight to live in a climate of this kind, and those who have lived under the blue skies of Santa Fe for any length of time are always anxious to return, no matter how great may be the attractions of other sections.

ATTRACTIONS FOR TOURISTS.

Santa Fe not only offers great attractions to the permanent settler and to the health seeker, but also to the transient guest, the tourist. A tour of the West is incomplete without a visit to this county, and it should be the last place that is cut from the itinerary of the man or the woman who wants to know the great Southwest. There is no other section in the United States which can afford in so small a radius so many sights of historic, archæologic, ethnologic, and scenic interest as Santa Fe. Twenty miles west of the capital city are the wonderful cliff dwellings and communal houses of a prehistoric race, which will be set aside in a national park to be called the Pajarito Park. Five interesting Pueblo villages are within easy reach of Santa Fe, each

with its unique characteristics, peculiar fiestas, and picturesque dances, namely, Tesuque, San Ildefonso, Santa Clara, Nambe, and Pojoaque. There are also ruins of a pueblo a few miles from Santa Fe more recent than those of the cliff dwellings, but still very interesting. There are bottomless craters; lava fields; the falls of the Nambe and the Santa Fe; 20 mountain peaks, easily climbed, from 10,000 to 13,000 feet high; picturesque canyons, such as the Santa Fe Canyon, the Box Canyon, the Tesuque Canyon, the Cajon Grande Canyon, the Macho Canyon, the White Rock Canyon, and many others; fine panoramas and views from divides and mountain heights, and numerous other scenic attractions that delight the traveler and make impressions upon the visitor that are never forgotten. The great Pecos Forest Reserve, an ideal hunting and fishing ground, offers attractions that should keep any tourist a whole summer. Visits to the gold, silver, copper, turquoise, coal, and other mines of the county prove interesting to the transient visitor, as well as trips to the nearby ranches, such as the great goat ranch at Lamy, and to the many beautiful orchards.

Santa Fe is the best starting point for those who desire to visit or settle in the rich counties of Rio Arriba, Taos, and San Juan; the former great mining, agricultural, and stock sections, while the last named is preeminently agricultural and horticultural, although possessing mineral wealth and many scenic attractions. The hot and mineral springs at Ojo Caliente and in the Jemes Mountains and a number of mountain resorts, beautiful in their solitude, are easily reached from the capital city by wagon road or railroad. Good hotels, a fine sanitarium for health seekers, maintained by the good Sisters of Charity, and a hospitable people will make a stranger who comes here feel at home, and a tourist who spends a day or week or month or even a year here will feel himself well repaid for his outlay. A tent-city sanitarium is being laid out for the accommodation of health seekers, tourists, and residents in a delightfully situated suburban part.

THE CLIFF DWELLINGS.

The cliff-dwelling ruins are the most interesting on the continent. They are of two kinds:

1. *Cliff dwellings proper.*—These are houses built on high ledges under overhanging cliffs. They are closely allied to the ancient style of pueblo ruins. In these the back walls and ruins are formed by the natural cliffs, while the front and partition walls are of masonry consisting of rudely dressed stones laid in adobe mortar and chinked with smaller stones in a manner almost identical with that of the pueblo ruins.

2. *Cavate ledges.*—These dwellings are as strictly cliff dwellings as are those above described. For scientific purposes the term "cavate ledges" has been invented to distinguish them as a distinct type. It would be best for popular use to retain the simple term "cliff dwelling or cave dwelling." These dwellings are usually in high, and, in many cases, almost inaccessible cliffs. In the earliest stages they consisted of natural caves, but with the development of the people occupying them their dwellings were improved. In their highest state of perfection they consist of artificial caves in perpendicular cliffs. A doorway is hewn into the face of the cliff to a depth of from 2 to 5 feet. Then the excavation of the dwelling begins. A front room, circular,

oval, or rectangular, is dug out. It may be from 6 to 20 feet in diameter, according to the use for which it was designed. If for a sleeping room only, it is likely to be from 6 to 8 feet in diameter, with very low ceiling, often not over 4 feet. If designed for a kiva it may attain to a dimension of 15 to 20 feet in diameter. Those designed for general living rooms are usually from 8 to 12 feet in diameter, with ceiling not over 6 to 7 feet above the floor. There are usually one or more smaller rooms connected with the main living rooms by very small doorways. These were probably used for storage. The interiors are usually plastered to a height of about 4 feet above the floor with adobe mortar. In some places there is considerable attempt at wall decorations. The outer doorways are small, often not to exceed 1½ by 4 feet.

This class of cliff dwellings is best represented by those of Pajarito Park, the region lying northwest of Santa Fe. This is a tract embraced between the Rio Grande on the east, the Jemes Mountains on the west, the Rito de los Frijoles on the south, and the Chama River on the north. It is a park of great natural beauty, being for the most part a plateau of from 6,000 to 9,000 feet altitude and deeply seamed with canyons. The western portion attains an altitude of over 10,000 feet in places, and is covered with heavy growth of pine and spruce.

A considerable part of the tract is overlaid with volcanic tufa varying in thickness from 50 to 1,000 feet. In the northeastern part this is entirely eroded away. Throughout the north central part the tufa remains in long tongue-like mesas or potreras, which rise abruptly, in many cases perpendicularly, to a height of from 100 to 500 feet. In the southern part the tufa extends to the river in a sheet of varying thickness, and here innumerable canyons are cut out by the mountain torrents. The face of the country thus presents many miles of almost perpendicular cliffs of yellowish and orange colored tufa, and in these are found the cliff dwellings in almost countless numbers. During the past three years parties from the New Mexico Normal University have spent considerable time during vacations in exploring and mapping ruins. While the results of the work are still incomplete and unpublished, yet enough has been accomplished to show that this is one of the richest archæological fields on the continent. Many thousands of cave dwellings have been explored, the last of the stone communal houses have been located and mapped, hundreds of smaller stone ruins have been located and superficially investigated, and a small beginning has been made in burial-mound exploration. Another interesting line which promises good results is that of photographing and sketching the pictographs or rock writings of the prehistoric inhabitants. These inscriptions are evidently the work of tribes far more remote than the immediate progenitors of the Pueblos who occupied these dwellings in comparatively recent times, i. e., about three hundred and fifty years ago. Almost all of these inscriptions have been secured and are being worked up.

During the past two years the attention of the Interior Department has been drawn to this region, with the result that a special investigation of the matter was ordered, and based on the results of this investigation, a recommendation made to the National Congress to set aside all of the Pajarito Park that is situated on Government lands as a "Cliff Dwellers' National Park." This recommendation was embodied

in what was known as House Resolution No. 13071, introduced by Congressman Lacey, of Iowa, and favorably reported by the Committee on Public Lands, to which it was referred. This bill provides for the preservation and protection of all ruins situated in the park and will be passed at the next session of Congress.

A fine group of communal houses are those situated in the Pajarito Park. These are the largest that have been found, some of them having contained as high as 1,200 rooms. The largest and most interesting are Puye, Otowi, Tsankawi, Navakwi, and Tchrega. These have all been carefully mapped and measured, but very little excavation has been done. In the same region are several hundred smaller pueblo ruins, containing originally from one room up to 500 each. This class of ruins in the Pajarito Park are all built of volcanic tufa.

The Pajarito Park has the finest specimens and in the best state of preservation of these classes of prehistoric ruins.

POPULATION.

Santa Fe is the most densely populated of New Mexico's counties, excepting Bernalillo, its population, according to the census of 1900, was 14,685, but at present is fully 18,000, or eight people to the square mile. The census gave the city 5,603 people, not including the transient health seekers, the convicts at the penitentiary, the pupils of the Indian schools, the St. Michael's College, the Loretto Academy, the Presbyterian Mission School, the Deaf and Dumb Asylum, the St. Vincent's Orphanage, amounting to about 1,400 souls. There are besides on the Santa Fe grant, outside of the city limits, according to the last census, 1,276 people, thus giving the city a population of about 8,500, which is also indicated by its last school census, which gives the city proper 1,707 children of school age and the suburbs 683 children.

TOWNS AND PUEBLOS.

Santa Fe County has a number of prosperous towns and settlements within its boundaries in addition to the Territorial capital, of which a description is given under the head of "Cities and towns of New Mexico." At the time the census of 1900 was taken Cerrillos was the second largest town in the county with 673 inhabitants. It is an incorporated town and possesses an excellent public school system, and has a smelter which is one of the most modern in the West. Cerrillos is the center of a rich mining country and near the extensive coal beds of the Colorado Fuel and Iron Company at Madrid, which at the last census had 422 people. A large electric power plant has been erected at Madrid. Excellent building stone is quarried near the town. In that part of southern Santa Fe County is San Pedro, which when the last census was taken had 451 people. Here a fine copper smelter has been erected to treat the ores of the extensive workings of the Santa Fe Gold and Copper Company. Near San Pedro, almost a suburb, is Golden, a prosperous mining camp of 323 souls. Dolores is also in the southern part of the county on the Ortiz mine grant. Galisteo is an old agricultural settlement in the center of a sheep and cattle district. Many nice ranches are in its vicinity. The precinct is credited with 736 people. Glorieta is a mountain and railroad town with 250 inhabitants. It is also the center of an extensive lumbering

industry. It is the starting point for most of the travel and traffic for the Upper Pecos River and the Pecos Forest Reserve, and near it are large iron, copper, and coal deposits and the interesting ruins of the abandoned Pecos pueblo.

Northern Santa Fe County has a number of prosperous agricultural communities. The agricultural communities of that part of the county are Pojoaque, with 798 inhabitants; Santa Cruz, which has 674 inhabitants; Tesuque, 348 people, the settlement being across the divide 6 miles from Santa Fe; San Ildefonso, 398 people, near which the Government has completed an irrigation canal for the San Ildefonso Pueblo Indians. Chimayo, in the extreme northwestern part of the county, is credited with 319 people, and Canoncito or Lamy, 17 miles southeast of Santa Fe, with 323 people. Lamy is a railroad junction point, and nearby is the great Onderdonk live-stock ranch. A quarry of building and limestone is situated near the place. Extensive beds of plaster paris are found within a few miles north of this point. While these settlements are not incorporated yet they all have public schools and are the centers of fertile agricultural, stock, or mining districts, or are railroad towns, which some day, with more improved irrigation systems and more capital invested in mining and commerce, will become flourishing cities. Other settlements are Jacona, Agua Fria, Cienega, Turquesa, Hobart, Bonanza, Cieneguilla, Cow Springs, and Cuyumungue.

There are 5 Indian pueblos in the county, all very interesting for their primitive and quaint characteristics. The largest is Santa Clara, with 223 people; San Ildefonso, 137 inhabitants; Nambe, 81; Tesuque, 80, and Pojoaque, 12.

Along the Santa Fe Central Railway a number of settlements have been located or town sites laid out. They are Kennedy, at the crossing of the Santa Fe Railway; Clark and Stanley, near the O'Mara coal fields; Donaciano, on the Arroyo Hondo, and Vega Blanca. At each of these points station buildings and storehouses have been erected, and they are connected by telegraph line.

FUTURE PROSPECTS.

It is not what Santa Fe County has been or what it is, but what it promises to be in the future that marks it as one of the most remarkable sections in the southwest. Its superb climate in itself means eventually the establishment of many sanitaria for health seekers, the founding of summer resorts and the building of hotels and homes for people who seek an ideal summer and winter climate. Its large area of grazing lands must sooner or later bring cattle to cover its thousand hills, and sheep and goats by the hundred thousand to browse upon its mesas; its perennial water supply, which is increased enormously at a certain season of the year, must lead to the building of irrigation systems that will make the county rich in farms and orchards; its undeveloped mineral wealth must in time make it one of the richest mining districts in the west, giving employment to thousands of miners, and last, but not least, its industrial possibilities are such that even a Pittsburg might envy. Its great beds of fuel that can be mined cheaply; its possibilities for the development of water power; its comparatively dense population, which would furnish labor; its climate, so conducive to continued activity; its nearness to

the Oriental, Mexican, and South American markets; its great supplies of raw material, such as wool, hides, lumber, mica, ores; its transportation facilities, which will be added to from year to year, will make Santa Fe County a manufacturing center that must bring the population of the county up to ten and twenty fold its present number. Woolen mills, beet sugar factories, canneries, brickyards, tanneries, smelters, furnaces, steel mills, potteries, glove, shoe, and furniture factories, are a few of the manufacturing possibilities of this section, which is richly endowed by nature and evidently designed by Providence to be a center of great industrial activity. The future can not be painted in too glowing colors; for the example of Massachusetts, of Pennsylvania, of Ohio are before the world, commonwealths much less favorably situated, with fewer natural resources, which have become industrial empires in less than fifty years. New Mexico, and Santa Fe County especially, have within them the great natural resources which are bound to make them prominent in the industrial world, and the wise man who invests his capital in such enterprises at present, before the grind of competition is felt, will reap a rich reward. There is the making of many millionaires in the latent industrial possibilities of Santa Fe County.

FINANCIAL STATEMENT OF SANTA FE COUNTY.

Bonded debt.

Date of issue.	Date of maturity.	For what purpose issued.	Rate of interest.	Amount.
	Years.		*Per cent.*	
July 1, 1882	10-20	Current expense	8	$14,600.00
Jan. 1, 1885	15-30	do	6	27,000.00
Jan. 1, 1890	15-30	do	6	6,300.00
Jan. 29, 1891	15-30	Railroad bonds and current expense	5	281,500.00
Mar. 1, 1892	15-30	Railroad bonds, current exp., court-house, and jail	5	335,000.00
Jan. 1, 1893	15-30	Current expense	5	3,500.00
Aug. 2, 1897	10-20	do	6	13,139.00
Total bonded indebtedness				681,039.00
Unpaid coupons				293,734.96
Floating debt				8,385.90
Interest on same				8,503.15
School districts, Cerrillos and Santa Fe				29,383.70
Interest				2,556.40
Total indebtedness				1,023,552.11
Total assessed value of real and personal property for the year 1903				2,207,842.00

SIERRA COUNTY.

Area, 3,081 square miles. Population, census of 1900, 3,158. Present population, 5,000. Assessed valuation, $1,326,920. County seat, Hillsboro.

Officials.—Commissioners, U. P. Arrey, T. Murphy, V. Trujillo; probate judge, P. Torres; probate clerk, J. M. Webster; sheriff, M. L. Kahler; assessor, A. Kelly; treasurer, J. C. Plemmons; superintendent of schools, F. Luna y Garcia; surveyor, A. Preisser.

Newspaper.—The Sierra County Advocate, Hillsboro.

Post-offices.—Hillsboro, Grafton, Lake Valley, Engle, Fairview, Chloride, Las Palomas, Andrews, Kingston, Arrey, Hermosa, Monticello.

Sierra County is one of the smallest of New Mexico's counties, only six counties having a less area, yet it covers 1,971,960 acres, or 3,081 square miles, three times the area of the State of Rhode Island and more than one and a half times the area of the State of Delaware. Of this 1,775,000 acres are subject to entry under the Federal land laws, of which 274,379 acres are unsurveyed. Only 112,500 acres have been appropriated, and 75,000 acres are reserved. During the fiscal year ending June 30, 1903, 5,189 acres of public land were entered in the county, 4,909 acres of this under the homestead act. The county is in the Las Cruces land district, with land office at Las Cruces.

The population of the county was 3,158 in the census year 1900, the least of any county in the Territory. The population was larger ten and more years ago, but the decline in silver mining gave the county a setback, from which it is, however, recovering, as its gold and other mines are being developed, its stock industry is growing, and the value of its agricultural resources is being recognized.

The assessed valuation of the county in 1903 is $1,326,920, or more per capita than that of any other county in New Mexico excepting one. The census of 1900 gives the value of farms and live stock in the county as $1,829,000. The same census also credits the county with five manufacturing establishments, with $12,938 capital invested, and annual production worth $14,766. There are 100,000 cattle in the county, 75,000 sheep, and 30,000 goats. Many cattle were shipped to California during the past year, and many very fine goats were shipped to other points. The Armendaris land grant, in the eastern part of the county, is being stocked with a good grade of cattle at present by the Victorio Land and Cattle Company, which recently acquired it.

The population in 1900 by precincts was: Hillsboro, 557; Monticello, 391; Derry, 350; Kingston, 284; Fairview, 232; Las Palomas, 225; Faulkner, 219; Lake Valley, 215; Cuchillo, 200; San Jose, 172; Engle, 142; Tierra Blanca, 105; Hermosa, 66.

IRRIGATION AND AGRICULTURE.

Sierra County is rough and broken and the water supply is scant, the precipitation ranging from 4 to 6 inches during the summer, while the total per annum is probably in the neighborhood of 10 inches.

Irrigation is generally confined to the valleys of the few small streams flowing eastward toward the Rio Grande. None of these, however, discharge water into the Rio Grande excepting during seasons of excessive snowfall or heavy summer rains.

Although the water supply is small, it is constant, and probably on this account a higher duty of water is reached in this district than in any other portion of the Territory.

On the Rio Alamosa, 1,200 acres are irrigated in the vicinity of Cañada de Alamosa, Monticello, and above.

The Cuchillo Negro serves 1,500 acres at and above Cuchillo. There are irrigated from springs and the Rio Palomas, 540 acres; from springs and the Rio Las Animas, 500 acres; from springs and the Rio Percha, 100 acres; from springs and the Cienega Apache, 120 acres; and from springs and the Berenda Creek, 160 acres. This acreage consumes all the water at several points with the exception of the flood flow. Altogether there are not 5,000 acres under cultivation, but with the available water supply probably 50,000 acres could be cultivated if storage reservoirs were built. Grain, vegetables, fruit, and dairy products are in good demand and bring high prices. Anything that will grow in southern Kansas and Oklahoma will grow in Sierra County. Crops are certain, for by irrigation the farmer escapes the vicissitudes of floods and drouth. Fruit does exceedingly well in the river valleys and there are a number of fine bearing orchards in the county.

Natural reservoir sites are numerous. At comparatively small expense these advantages can be utilized for the storage of flood waters. Near Engle artesian water has been struck and there are indications that artesian wells are possibilities of the near future in other parts.

The Nogal Canyon, San Jose Canyon, Cañada Alamosa, Cuchillo Negro, Los Palomas, Los Animas, North Percha, Middle Percha, South Percha, Trujillo Creek, Tierra Blanca Creek, and Berrendo Creek are the main valleys of the county and all have natural reservoir sites. There are a number of other canyons, from 10 to 25 and 30 miles long, that have splendid land in them that could be farmed if water were put on the land. At the present time there are no settlers on the land. There can be no doubt that water can be developed in every one of the valleys by up-to-date well-boring apparatus. On an experimental scale fine cotton and tobacco have been raised in the county, and large areas would be planted if the water for irrigation were developed.

STOCK RAISING.

Sierra County has a fine range. It is one of the best stock counties in the Territory. There is a good underground water supply that can be developed by wells. Sheep men and goat raisers are beginning to realize that on account of the mild winters and the good range Sierra County is a sheep and goat raising region par excellence. The county takes the lead in New Mexico in the goat industry. In fact, its fame in that direction is becoming national. Some of the highest grade prize Angora does and bucks are to be found on its famous goat ranches, and the names of the leading goat raisers are known in every one of the important goat markets of the United States. The goat industry is proving very profitable. The mountainous character of

this country, its mild winters, cool summers, and good range adapt it especially well to the raising of goats.

There are great possibilities for the farmer in Angora goats. If used alone for clearing brush they are a good investment. Acres of valueless land can be transformed into pasture by a herd of Angoras in two or three years. The fleece will pay the interest on the money invested in them and enough to pay for keeping them. If properly managed the flock will double itself yearly, enabling the farmer to sell his goats and come out with his land cleared and money in his pocket. A browser, instead of a grazer, the Angora prefers weeds and brush to grass, and will kill the brush every time by eating off the leaves and bark. Once dead, the stems soon rot away and fall, removing the last hindrance to the growth of grass.

Aside from its value in clearing land, the Angora is a money-maker. It produces a fine quality of mohair, used in the manufacture of plush and fine dress goods, which can be sold readily at a price ranging from 30 to 40 cents a pound. The pelts, undressed, bring from $1.50 to $3.50 each, according to the length and fineness of the hair. Angora pelts make a soft and beautiful robe that can be dyed any color. Angora meat is seen occasionally on the market as "well dressed mutton" without a trace of the woolly flavor which at times makes mutton objectionable. The foliage upon which the goat feeds gives to the flesh a taste which most resembles venison, the deer being an animal that in its habits is very much like the Angora.

The capital required to begin raising goats is small. The goats require very little attention. A herd of 50 high-grade does, a good starter for an inexperienced man, can be purchased at a price anywhere from $4.50 to $6 a head. A good pure-bred buck costing $50 should be obtained at the same time, and by breeding up, eliminating, and disposing of the lower grade progeny and retaining for feeding purposes those which approach the standard of the buck, a large herd of pure-bred goats will be evolved in a few years. On scrubby, brush-infested land, which is the ideal location for the goats, the animals will provide for themselves during the summer, and corn fodder, straw, or coarse hay, with a little grain in March and April to strengthen them for the kidding season, is all that is required in the winter. Their long hair protects them from the dry cold, and the only shelter required is a shed open at the south and rain-tight to protect them from snow or wet, which freezes on their heavy coat of hair and chills them.

Breeders all over the country give the most valuable evidence of the genuine and lasting service rendered by the Angoras. From these reliable sources of information come the encouraging proofs of the grand service rendered to every section where these animals are reared and put to their especially legitimate work. The following are some of the facts: Land cleared by Angoras, formerly almost worthless, now generously feeds and fattens one steer to every acre. The Angora clears, enriches, and cultivates the land by scattering concentrated manure and tramping in the manure with its sharp hoofs in almost perpetual motion, leaving the soil loose and rich, inviting the growth of nutritious grasses. While the tendency of sheep is to bite the grass so close to the ground that the roots are killed during long dry seasons, the Angora leaves the grass to retain the moisture, thus keeping pastures perpetually fresh and growing, while injurious weeds, briers, and brush are prevented from taking the soil food from

the grasses, because of the Angora having destroyed these by turning them into meat and in the mohair on its body.

Leaves, buds, bark, and briers are rich in food elements, which goats can only turn into richer land and larger bank accounts. The Angora kills pernicious brush and rends root and branch. Plants can not live without lungs any more than animals, and 200 Angoras will clear up 40 acres of the worst and most worthless ground within a year.

At the rate at which the Angora goat is now securing a foothold in the West and Southwest the time is not far distant when the goat industry will take precedence over the business of cattle and sheep culture. Since 1849, when the first Angora goats were brought to this country by Dr. James B. Davis, of South Carolina, who received them as a present from the Sultan of Turkey, goat raising has slowly but surely gained a standing among the industries of the West, until now there are many more than a million goats in Arizona, New Mexico, Texas..California, Idaho, Utah, and Oregon.

Stockmen are awakening to the great possibilities in the Angora. Almost every region of the west possesses the peculiar requisites for attaining the best results in raising Angora goats, and experts declare that the conditions in the mountainous regions of Sierra County are almost identical with those of the province of Angora, Turkey.

So great is the confidence in the future of the goat industry that a large amount of capital is being put into goats by sheep growers. Several companies have been formed for the establishment of immense herds on the mountain ranges.

The mohair or wool is worth twice as much as sheep wool, and the flesh is sweet, clean, and healthful. The goats can browse and secure food in the rocky hills where sheep will not venture, and they are more hardy than sheep or cattle, being better able to stand the extremes of heat and cold.

The flesh of the young Angora is in many respects superior to lamb, and is in demand in Kansas City, Chicago, and New York.

Mrs. Armour, residing near Lake Valley, owns large herds of these animals, from which she is said to be making a very handsome income. Some years ago she was left a widow, in humble circumstances, with a large family dependent on her for support. By chance there drifted into Lake Valley a ranchman with a herd of 90 Angora goats for sale. Mrs. Armour had no money and did not desire to borrow, so she made a proposition to take a small flock of the goats, care for them, and breed them, and at the end of the year divide profits with the owner. The proposition was accepted. She took the goats and her children and went up a mountain where scrub oaks grow in profusion.

She located a claim, built a shack, and settled down to work. At the end of a year her success was such that she had money enough to buy a small flock of her own and start out independently. Since that time each year she has added to her property. She now employs 20 goat herders. Mrs. Armour has made herself wealthy and sent her eldest son to college, where he is now studying law.

E. D. Ludlow, of Lake Valley, inspector for the American Angora Goat Breeders' Association, writes that there are at present 30,000 high grade and recorded goats in the county, including some of the finest stock to be found in the United States. The county claims Pasha Columbia, the sweepstake buck at Kansas City in 1901, and for which

Mrs. Armour, of Kingston, paid $1,050 at auction. The past year Mr. Taylor, of Lake Valley, sold a buck of his own raising for $700, it being the sweepstake buck for 1900 at Kansas City. There was also at the Kansas City show a buck from this county which took the second prize in 1901. Residents of this county at that show purchased two bucks—Julius, No. 14990, and Chabbie of Maverick, No. 15812—being first and third prize winners, respectively. These facts go to show that the county has some good stock in this branch of animal industry. There is room here for ten times the number of goats at present on the ranges. The county has the best feed for goats to be found in the United States, with a high dry climate so desirable for the raising of mohair. There is an overabundance of live oak, mountain mahogany, manzanilla, juniper, cedar, and other live foliage, which gives the finest kind of browsing both winter and summer. The limited amount of water, so desirable for goats, is also a factor, for it brings them back to the home ranch every evening. Then there is the free range—no rent to pay for land, no fences to build, no other expenses of the nature that must be incurred in other sections.

MINING.

Sierra County is a vast treasure house of the precious metals. Parallel with the Rio Grande are three important mountain ranges. They are the Black Range, the Cuchillo Negro Range, and Caballo Range. The first is a part of the Continental divide, which is known farther south as the Mimbres Mountains, and lies near the western boundary of the county. The second is a continuation of the San Mateo Mountains of southern Socorro County. The Black Range and Cuchillo Negro Mountains run nearly parallel, their summits being about 15 miles apart. The section of country through which these mountains pass, from Ojo Caliente in Socorro County to the Rio Seco below Hermosa in Sierra County, is known as "the Black Range country." Minor ranges are thrown up between the above systems and the Rio Grande, but have no extensive continuity, yet have their place in the geographical and industrial divisions of the county.

THE BLACK RANGE.

The Black Range is an unbroken chain over 120 miles in length. The prominent peaks of this range attain an altitude of from 8,000 to 10,000 feet. Its slopes and valleys are covered with a thick growth of pine and other valuable timber, the dark foliage of which has given rise to its distinctive name. Numerous herds of cattle and flocks of sheep and goats find sustenance the year round in its nutritious grasses and herbs, and in its remote recesses bear, deer, and small game abound.

Primitive rocks of the granitic series compose the central and higher portions of the range. Lapping on this formation, along its base and sides are strata of quartzite, limestone, and shale, faulted, pierced, and distributed by eruptions of porphyry, which have occurred at different periods and along two distinct lines parallel to the range—the first at the base, and cutting through the foothills; the second, 8 or 12 miles distant, displays a series of nearly circular groups of lofty hills.

The mines occur along the eruptive lines—on the first in the form of contact veins, between shale and lime; and on the second in the form

of fissure veins in the hill groups and blanket veins in the lower country. At Chloride and Grafton, and some other points, fissure veins appear also in the primitive rock series, extending sometimes into the adjoining limestone.

The Black Range districts are on the main mineral belt that follows the east slope of the Continental Divide, commencing on the south at Cooks Peak, passing through Lake Valley, Hillsboro, Kingston, Hermosa, Chloride, and Grafton, and finally sinking with the Black Range on the south side of the San Augustine plain. The mineral belt of the districts is from 4 to 8 miles wide and 20 miles long. The Black Range has six mining districts, viz: The Black Range, Apache, Palomas, Limestone, Cuchillo Negro, and Iron Reef.

The formation of the districts is porphyritic, principally andesite, with occasional belts of trachyte and limestone, with the exception that localities in the vicinity of Chloride show large deposits of limestone, while the upper portion of Chloride Creek is a porphyritic formation, principally andesite, with some diorite, phomolite, and trachyte. Some portions skirting the summit of the range (Continental Divide) are capped with rhyolite; no mineral veins of value have as yet been discovered breaking through the rhyolite capping.

The veins are contact and clean-cut fissures. The mother lode can be traced for 20 miles. Many of the prominent properties are on that vein. Several lodes run parallel with the mother lode; many of them can be traced for 2 or 3 miles without a break. The strike is north and south, dip to the east at 65 to 70°. The gangue in the veins of the entire district is silica. The values of the northern portions are in gold and silver, with gold predominating. The southern portion shows more or less copper in addition to silver and gold values.

The Black Range districts were discovered in 1880, when a great many locations were made and much development done. The great distance from the railroad, the frequent raids by the Apaches, the high price of labor and supplies at that time made mining an expensive business. It is hard to find a mining section with the limited development showing as many shipping propositions. Prospects with shafts from 30 to 100 feet deep show smelter returns from $3,000 to $8,000.

LAKE VALLEY.

The ores of the Black Range are inclosed and almost surrounded by a lateral strata of quartzite resting upon dolomite. The southern end of the range is the location of the famous Bridal Chamber, where $3,000,000 worth of almost pure silver was extracted in six months. This mine is located near the town of Lake Valley. On the east side of Lake Valley, where are the Stone Cabin, Standish, and Black Prince claims, the great iron-flint blanket comes to the surface, denuded of its lime covering. In such places as the flint has been penetrated by shafts it is found to be of great thickness, and the bottom has not yet been reached at 50 feet and more. To the west of the camp and of all the developed mines about half a mile is a mountain of porphyry, and along its base the same ore is found in huge bowlders, but not in definite place. Several carloads of this bowlder ore have been shipped and have brought from $40 to $60 per ton.

The rich ores of Lake Valley are of the solid horn silver, sulphide of silver, and flint carrying horn silver. Other ores are quartz impreg-

nated with silver, and lead, both as galena and carbonate. Iron manganese ore, worth from $2 to $20 and too siliceous for fluxing purposes at the smelters, is piled up in the dumps all around and about the mines. Where the value of this material is higher, and the silica is not too predominant, it can be shipped at a small profit. It is a fact that the dumps of the Lake Valley mines are composed entirely of ore. Nothing else comes out of the mines, as the great flint blanket itself is really a low-grade ore.

A fortune awaits the man who can devise a cheap process for utilizing this ore. The quantity is inexhaustible, and there are thousands upon thousands of tons already mined and surfaced.

A prominent feature at Lake Valley is the great quartzite dike, which starting south of here extends north to Hillsboro and skirting around that camp is still traceable many miles farther.

North Percha and Tierra Blanca, two other great silver camps, are located on this Lake Valley belt, some 18 miles distant. Gold ores have also been found in quantities in both camps.

THE HILLSBORO DISTRICT.

The next camp toward the north from Lake Valley is Hillsboro. It is located upon the eastern contact of the mineral belt of the range. The formation where the rich gold ore is found is porphyry. The veins are true fissures. The Bonanza mine alone paid dividends amounting to about $250,000. Hillsboro also has extensive and very rich gold placers. It is the oldest camp in Sierra County and has produced altogether about $9,000,000 in gold.

The Hillsboro district may be compared to an immense wagon wheel, all the veins converging to one common center (the hub). That center is a basin about one-half mile south of W. H. Andrews's mill. The Andrews Company owns seven claims south of the mill, all being opened up and blocked out. Besides keeping the 100-ton concentrator going day and night, the company has a splendid mill, using four Frue vanners and four Wilfley tables. It employs about 100 men at its mines. This company has done much to encourage mining in the whole district and to give it new blood. South of the mill, about one-half mile, the Copper King Company owns claims that a number of these veins must enter. The center is a basin of good size, where all the veins converge. Over twenty-five distinct veins are opened up, all going to the one basin. The number of claims on each vein is about six, making in all about 150 claims in this one district. These veins are no strings, but big, strong, and healthy, from 3 to 5 feet wide, with pay streaks of 6 inches to 3 feet wide.

The leading mines located on spokes of the big wheel average six claims to the spoke. Among them are the Montreal, Enterprise, Golden Era, Garfield, Eldorado, Richmond, Bonanza, Snake, Bobtail, Opportunity, McKinley, Wicks group, Bull of the Woods, Blacksmith, The Trippe, Andrews, El Oro, and Mrs. B.

The Bonanza has produced over $1,000,000, the Opportunity over $500,000, the Snake and Bobtail, on the same vein, considerably over $100,000. The Wicks has produced much ore, and has blocked out over 5,000 tons. The Richmond has produced over $250,000, and the leasers at the 350-foot level are in $160 ore. The Garfield is a steady shipper to the El Paso smelter.

KINGSTON AND HERMOSA.

The great silver camp of Kingston, north of Hillsboro, has produced $7,000,000 in silver.

The Black Range mineral belt again shows richly at Hermosa, 27 miles north of Hillsboro, in a great body of limestone of dolomite character. The silver camp of Hermosa has shipped about $2,000,000 in silver, the Palomas Chief alone having produced over $500,000. It has recently passed into the hands of the Palomas Chief syndicate, composed of Boston capitalists, who are systematically developing the property, with good prospects that its past production is only a forerunner of what its future will be, after it has been thoroughly prospected and developed. Notwithstanding the great silver production in the early days, the camp never had a dollar of outside capital invested in the early development of its mines, the mines having paid for their own development, and good dividends besides. This camp has a great future and offers good opportunities for the prospector and investor.

CHLORIDE.

From Hermosa camp the mineral belt can be traced into the Apache mining district, of which the town of Chloride is the business center. Here great veins of mineralized quartz crop above the inclosing country formations. Along the eastern contact the greatest amount of work has been done, commencing at Byers Run. Here the vein in one place at the Cliff mine shows a width of more than 5 feet. Thence looking along the vein are evidences of work done, in piles of ore lying at the mouths of tunnels and shafts. These ores are rich in silver, and carrying gold enough to make their reduction profitable—that is, from $8 to $10 gold per ton. The veins in this vicinity lie mostly between lime and porphyry, and are from 10 to 30 feet wide. The filling is generally of a hard, grayish quartz, heavily impregnated with mineral. This mineral belt can be traced from the large bodies of lead at Cooks Peak to the large deposits of lead at Magdalena, a distance of 120 miles.

While this particular section shows a great deal of high-grade ore the great bulk of it will not stand shipment, and its future prosperity depends, to a great extent, on treating the enormous bodies of medium-grade ore on the ground. The Midnight, St. Cloud, U. S. Treasury, Readjuster, Nordhausen, Great Republic groups, and many others that can be mentioned can be secured at present at nominal prices. The U. S. Treasury shows 24 feet of milling ore (an ideal cyanide proposition) on the 100-foot level—value of ore about $10 per ton in silver and gold. The Readjuster shows a 60-foot vein of ore on the 200-foot level, averaging 30 to 40 ounces silver and a small amount of gold.

The Mines Development Association is now systematically developing the New Era group, on the head of the Chloride Creek, from which they are making regular shipments (from development only). The 200-foot level is 70 feet below the bed of the Chloride Creek, which is the deepest working. A steam hoist and pump are now being installed and the working shaft continued to a depth of 500 feet.

The group was abandoned and remained open for location for a long time. Two or three years ago it was relocated by the Terry Brothers under the name of the "New Era." Less than $2,000 was expended

in systematic development when an ore body of considerable extent was reached, and double that sum was realized from the first two shipments.

The Silver Monument, adjoining the New Era, within sight of Victorio's Outlook, produced over $100,000 worth of ore before 1893. It has lain idle since then until a short time ago, but is now being worked and high-grade shipments are being made. A 40-ton mill was recently installed and is now successfully running on the low-grade ore from the Silver Monument and New Era mines. The main shaft is down 400 feet and the ore is bornite, rich in silver, and carrying gold and copper. The ore as shipped from this portion of the camp is sorted to average from 100 to 200 ounces of silver and from 10 to 20 per cent copper per ton.

The Colossal comes next to the Silver Monument in production, with $60,000 to its credit as a shipper.

A group of claims is now being worked on Mineral Creek near the town of Chloride, and a small stamp mill is being operated.

History of the district.—In 1879 Harry Pye, a mule skinner, working for Uncle Sam, hauling freight to a military post, picked up rich float in the canyon where Chloride now stands. Pye knew something about mineral, and at his destination had the ore assayed. Finding it contained chlorides of silver running several ounces per ton, he gave this information to several friends, and when his contract with the Government was completed he made up a small party, returned to the spot, prospected the country, found the mother lode, and made the first location, which is still known as the Pye lode. The camp was started and named Chloride, because of the character of the ore found. Pye and several of the first settlers were killed by the Indians.

FAIRVIEW.

Fairview started in 1881, and up to 1883 had a population of about 500. It takes its name from the beautiful surrounding scenery, being situated in a small valley surrounded on all sides by picturesque mountains, covered with abundance of timber.

GRAFTON.

Grafton, 10 miles northwest of Fairview, participated in the promising prosperity of the early eighties and boasted of a population of over 300. It now has 15 houses. At this camp is located the once famous Ivanhoe mine, the stock of which was floated by Col. Robert Ingersoll and his associates in 1882 and 1883. Development work consists of a 250-foot tunnel on the vein. The first-class ore of this property yields 17 ounces gold per ton. The Ivanhoe vein enters the Emporia claim, upon which 750 feet of work has been done in ore. Shipment returns of Emporia ore show 13 ounces gold per ton.

KINGSBURY.

The next place along this vein which has been prospected sufficiently to warrant an estimate of value is at Kingsbury, 3 miles north of the Emporia mine, at which camp is located the Great Republic group of mines. Ore worth $1 per pound in gold has been mined here in places, and general shipments from the whole group have paid handsomely.

This property is now in active operation. A steam hoist has just been installed and a 10-stamp mill is nearly ready to start. There is at least two years' supply of ore blocked out for milling.

In the early eighties the mining camps of Fairview, Chloride, and Grafton were all prosperous mining camps with 300 or more population each, with good hotels, business houses carrying large stocks of goods, saloons, dance halls, theaters, and connected with the outside world by three daily six-horse stage lines.

ROBINSON.

About 1882 considerable excitement was created by the proposed building of a branch of the Santa Fe to a point 3 miles northwest of Fairview, and the town site of Robinson was laid off, named in honor of one of the Santa Fe officers at the time. The railroad branch line did not materialize and now about twenty-five houses and thirty people constitute Fairview and forty houses and fifty people Chloride, while not a house or foundation is left to mark the spot of Robinson City, which is now included in a cattle ranch.

THE EASTERN SLOPE.

The eastern slope of the Black Range and both sides of the Cuchillos are seamed with veins of metal-bearing rock, some of which are of great extent. No part of the mining section of the United States has better surface indications than the Black Range country. What is needed is judicious development.

There is here a great opening for the live prospector, some of the best locations having been made during the past year. The altitude is from 6,000 to 8,000 feet. Timber for mining purposes and wood for fuel are abundant. Wood can be contracted for years to come for $1.50 per cord. Water is plentiful in all the gulches. With railroad communication the Black Range will be heard from.

THE CUCHILLO RANGE.

In the Cuchillos, Edwards Camp sprung up and operations continued for years. Farther south the Black Knife, German, Rifle Shot, and a number of other good locations were made in 1882.

EAST OF THE RIO GRANDE.

East of the Rio Grande, the Sierra, Fra Cristobal, and Caballo ranges rear their lofty crests 8,000 feet above the level of the sea, and contain valuable deposits of silver, copper, iron, lead, and coal. These mineral riches have as yet only been ascertained to exist in outcroppings, and no mining to any extent has been done there. Closely contiguous, however, to the Santa Fe Railroad, these sections will in the future contribute to the wealth of the county and to the private fortunes of many an enterprising miner and investor.

The Caballo Range has been but little prospected as yet, but nevertheless many good claims have already been located there.

A group of mines situated on the east side of the range is now being investigated by engineers, in the employment of John Harp Hammond, for Baltimore capitalists. The investigations so far indicate that the property will soon be in active operation.

There are fuel and water in abundance throughout, and, on the whole, Sierra County offers a rich field for prospecting parties.

The inducements are much greater to the mining man to come into the Black Range, and parallel ranges, with their rich mineral fields, so easily and comfortably reached the year round, than are offered in the Klondike or other northern mining sections.

OTHER MINERALS.

Abundant coal indications exist in different parts of the county, especially in the vicinity of Engle, where the Colorado Fuel and Iron Company has diamond drills at work testing the thickness of the veins.

Extensive beds of marble, white, black, and variegated, have been opened near the Animas River.

Lead-carbonate ore exists in vast quantities in the Black Range. No production of large importance has yet been made, but the future will see these valuable ore veins developed.

RAILROADS.

The Atchison, Topeka and Santa Fe Railway passes through Sierra County from north to south. Its distributing points are at Lake Valley for the south and Engle for the east, from which two stations stage and freight lines penetrate to the different settlements and camps. From Nutt station a spur of the Santa Fe Railway runs to Lake Valley, a distance of 13 miles. The roads to Hillsboro, Kingston, Hermosa, Fairview, Chloride, and other points are good.

An important railway project is the Black Range Railway, which has been incorporated and is to be built from Magdalena, Socorro County, to Chloride, and probably from Chloride to Engle, there to join the main line.

PUBLIC SCHOOLS.

Excellent schools are maintained in the 17 school districts. Eight to ten months of the year are devoted to the education of the children, and the teachers selected are of the very best character. The school fund has always been cherished, and commodious, substantial, and handsome schoolhouses have been built and are being built. In all departments of primary education the school system of Sierra County will bear comparison with communities otherwise far more advanced.

CLIMATE.

It is not too much to say of this land of sunshine that there exists a perpetual summer. There is just enough of cold in the months of November and December to mark the change from summer to winter, while a fall of snow is rare, and at most does not remain upon the ground more than a few days. In the higher portions of the mountain ranges some snow is preserved during the colder months, and serves to maintain the summer streams. With such a winter temperature it might be expected that a very high temperature would rule in summer, but such is not the case. From 90° to 95° in the shade is the greatest heat recorded. The altitude—4,000 to 6,000 feet—of the main portions

of the region will account for these moderate extremes. In such a climate mining operations are pursued to the greatest possible advantage, and agriculture, aided by irrigation, has no drawbacks. The devastations of snowslides and blizzards are unknown, and the same may be said of pneumonia, that scourge of the miners in the north. It is an ideal section for healthseekers, especially those suffering from pulmonary complaints.

SETTLEMENTS.

Hillsboro, the county seat, is described under the heading of "Cities and towns of New Mexico." At Las Palomas, on the Rio Grande, and at Ojo Caliente, north of Grafton, are hot springs famous for their curative qualities. Above this settlement some 200 acres are under irrigation and yield good crops. With storage reservoirs the area under irrigation could be greatly increased.

Palomas Hot Spring can be reached from the railroad station at Engle in about three hours' ride. The spring is noted for its curative qualities in cases of rheumatism. People have been carried there on mattresses and in from ten to twelve days returned on horseback. The following is an analysis of a sample of water from the spring, the figures representing parts in 100,000 parts of the water:

Total solids		263.50
Lime	22.50	
Magnesia	3.10	
Soda	100.32	
Potash	7.00	
Iron, alumna, Fe 0 .03, Al 0 .03	0.00	
Silica	4.50	
Sulphates	6.00	
Chloride	122.50	
Carbonates	17.55	
Crystal water	7.60	
	291.07	
Less oxygen, equivalent of	27.57	
		263.50

Fairview is a supply point for the mines of the Black Range, between Chloride and Grafton, and for the mines of the Cuchillo Negro Mountains. It is located in a beautiful and open valley.

Grafton is a picturesque mining camp, and is surrounded by a rich mining district.

Chloride is situated 20 miles north of Hermosa, among the foothills of the Black Range, in a district of gold and silver bearing fissure veins. The nearest railway point is Engle, a distance of 50 miles.

Lake Valley, the famous silver camp, is the terminus of a short branch of the Santa Fe Railway. It is an important cattle-shipping point.

Hermosa is a mining camp, romantically situated in a small park surrounded by lofty mountains of bold and majestic outline, stately pines, and flowing streams.

Kingston lies 10 miles northwest of Hillsboro, and is delightfully situated in the valley of the Rio Percha, among the foothills of the Black Range, at an elevation of a little over 6,000 feet.

Tierra Blanca is a mining camp 10 miles south of Kingston. It is situated in the beautiful and sheltered valley of the Rio Tierra Blanca, and at one time had a flourishing sanitarium.

Andrews is a mining camp 8 miles north of Hillsboro, and here are the famous Andrews mines, that are being worked by Pennsylvania capitalists.

Monticello is an agricultural settlement on the Alamosa.

Cuchillo is an agricultural settlement on the Cuchillo, 24 miles west of Engle.

Engle is the principal railroad and shipping point in the county, and is the center of one of the finest cattle ranges in the Southwest. Artesian water has been struck near the town. If the flow proves permanent and other wells are drilled, Engle will also become the center of an agricultural region, for a constant water supply is all that is needed to make it the center of a rich agricultural section. The indications of coal around Engle are many, and it is believed that strong veins of this fuel will be found in the course of time.

FINANCIAL STATEMENT OF SIERRA COUNTY.

The total indebtedness of Sierra County June 30, 1903, is $55,000, evidenced by fifty-five $1,000 bonds, as follows:

Refunding bonds issued September 1, 1901, mature 15–30 years, interest 5 per cent	$55,000
Total assessed value of real and personal property for the year 1903	1,326,920

No accounts unpaid; funds in good condition.

The decrease in the valuation of property this year is principally in the valuation fixed by the Territorial board of equalization on the Armendaris land grant.

SOCORRO COUNTY.

Area, 15,250 square miles. Population, census of 1900, 12,195; present population, 16,000. Assessed valuation, $2,086,610. County seat, Socorro.

Officials.—Commissioners, John Greenwald, A. Contreras, C. Padilla; probate judge, M. Miera; probate clerk, B. A. Pino; sheriff, L. Baca; assessor, B. Sanchez; treasurer, H. G. Baca; superintendent of schools, A. C. Torres; surveyor, W. W. Jones.

Newspapers.—The Socorro Chieftain, Socorro; The San Marcial Bee, San Marcial; El Comercio, San Acacia.

Post-offices.—Socorro, San Marcial, Magdalena, San Antonio, Kelly, Puertocito, Burley, Datil, Frisco, Joseph, Patterson, Quemado, Reserve, Riley, Bernardo, La Joya, Lemitar, Polvadera, Sabinal, San Acacia, Clyde, Lava, Paraje, Rosedale, Alma, Cooney, Graham, Mogollon, Luna, Estey, Jornado.

Socorro, the largest of New Mexico counties, with its grand mountain masses, its grass-covered plains and table-lands, its resources, its river courses, its climate, its scenery, its inhabitants, and its history, is typical of the great Spanish-American southwest, more so, perhaps, than any other county in New Mexico. Here the Titanic forces of nature, seemingly, have had their playground, for they reared mountain mass upon mountain mass, not running in parallel ridges but consisting of apparently independent groups and knots thrown up in a haphazard fashion until one-third of the county is mountain and there is scarcely a spot within its boundaries from which mountains can not be seen on every side. Here canyons, parts of which the sun seldom touches, carry the waters from the hills; arroyas, or dry water courses, which become raging torrents after a rain, have made deep incisions into the loose soil; volcanoes in past ages have thrown up enormous masses of lava, covering many hundred square miles of land, forming caves and frozen billows, upon which vegetation finds but a sparse subsistence; there are salt lakes reputed to be bottomless; vast stretches of grass-covered plains and laughing, fertile valleys; mountain torrents and perennial rivers; forests that cover large areas, and again, desolate alkali flats and barren plains. A wonderful county, indeed, rich in everything that mountain, mesa, and valley can produce; gold, silver, copper, lead, and other minerals; cattle, sheep, goats, and horses, and other live stock; orchards, farms, towns, a peerless climate, mineral springs, and scenery which can not be surpassed for grandeur and for variety; a county developed only in a few spots and offering untold opportunities to those with capital to invest or with energy and intelligent effort to apply.

AREA AND POPULATION.

Socorro County is bounded on the north by Valencia County, on the east by Lincoln and Otero counties, on the south by Otero, Doña Ana,

Sierra, and Grant counties, and on the west by Arizona. Its area is 15,250 square miles, being 15 times as large as the State of Rhode Island, over seven times as large as Delaware, over three times as large as Connecticut, over twice as large as Hawaii or New Jersey, and considerably larger than Vermont, New Hampshire, Massachusetts, or Maryland. The States of New Jersey, Connecticut, and Rhode Island could all be placed in the county without taking up all of its area. This great domain is but sparsely inhabited. The average population per square mile is but 0.8, and taking away the eight principal settlements the average population is but 0.4 per square mile. Settlements are far apart, and in several sections post-offices are 40 to 45 miles from each other. In the area east of the Rio Grande, almost 3,000 square miles, there are but two post-offices, one at the mining camp of Estey City and the other at a little settlement called Clyde. Thus far many of the vast plains have no permanent habitations, only great herds of cattle and flocks of sheep traversing them from time to time or grazing peacefully upon them the year around, while the lonely mountains are uninhabited, except where mining camps have sprung up or where a prospector may have pitched his tent. It is for this reason that Socorro County offers such great opportunities to the newcomer with capital, for the county is undoubtedly enormously rich in resources and can sustain many times its present population. According to the census of 1900, there are 12,195 people in the county. The population of the towns and precincts, according to the census, is as follows:

Socorro	1,512	Escondida	297
San Marcial	1,018	Paraje	282
San Antonio	642	Luna Valley	278
Kelly	616	San Pedro	276
Mogollon	599	La Mesa	267
Santa Rita	536	Ranchos de la Joya	211
San Juan	473	Gila	199
San Acacia	460	Canta Recio	193
Middleton	452	Tularosa	165
Lemitar	428	Las Nutrias	159
Polvadero	417	Rosedale	146
Mangus	400	Contadero	142
La Joya	342	Alma	128
Sabinal	317	Bosquecito	128
Magdalena	300	Frisco	98
Valverde	300	Cherryville	67
Luis Lopez	299	San Francisco	48

Of the total area 8,300,000 acres are still subject to entry under the Federal land laws, 6,299,614 acres of that area being surveyed and 2,000,000 acres unsurveyed. Only 1,050,000 acres have been appropriated thus far, and the greater area of that is within private land grants, of which Socorro County has quite a number. A part of the Gila River Forest Reserve is situated in Socorro County, and 278,008 acres are reserved for various other purposes. During the year ending June 30, 1903, 13,537 acres of public land were entered, 10,189 of them under the Federal homestead act. For northern Socorro County Santa Fe is the Federal land office, while for the southern part of the county the land office is at Las Cruces.

The county has an assessed valuation of $2,086,610, or over $175 per capita, being about the average per capita assessment for New Mexico. There are 127 miles of standard gauge railroad in the county, and 199 miles of telegraph. These figures indicate the amount of development, or rather the great room for development, within the rich domain.

RIVERS.

Outside of the independent river courses which lose themselves in the sand, such as the Mangus, Largo, Datil, Aito, and Chupedero, the county is drained by the Rio Grande and its tributaries, the Gila and its tributaries, the San Francisco and its tributaries, the Tularosa, Diamond, and Middle Fork, which latter in their course through Socorro County are mountain streams. The Rio Grande flows largely over a bed of quicksand. The river bed at times shifts its course, settlements having, even in recent times, changed their situation from one side of the river to the other, or are now quite a distance from the river, although originally built on its banks. The Rio Grande's principal tributaries in Socorro County are the Puerco and the Salada.

AGRICULTURE AND HORTICULTURE.

Socorro County can not be called an agricultural county, only a very small part of its area being under cultivation, but in the broad valley of the Rio Grande, along other river courses, and in a few isolated valleys, farms and orchards give indications of the possibilities in the agricultural line. Around Socorro, San Marcial, San Antonio, and other settlements there are beautiful orchards in which the fruits of the temperate zone reach a perfection not attained anywhere else outside of New Mexico. The wheat raised in the Rio Grande Valley, in Socorro County, is of excellent quality, and vegetable gardening yields rich returns. Owing to the small area under cultivation and the prosperous mining camps and cattle ranches in the county there is always a good market for orchard and garden products.

IRRIGATION.

Socorro County has no extensive irrigation systems. The ditches and laterals which served their purpose a hundred years ago are still doing service. There is room for the investment of capital in storage reservoirs and irrigation canals as well as in the development of water by means of pumping. In the American Valley a large storage reservoir is to be built, and a considerable area is to be brought under cultivation. There are about 25,000 acres under cultivation in the county, but there is water supply, if carefully husbanded and distributed, to irrigate twenty to thirty times that area.

LIVE-STOCK INTERESTS.

It is in the live-stock industry, however, that Socorro County is one of the leading counties of New Mexico. Its ranges are vast in extent, and upon them graze 150,000 head of cattle, 50,000 head of horses, 15,000 goats, and some 250,000 head of sheep. The mild winters and the abundance of grass the year around make the live-stock industry very profitable.

TIMBER.

The timber area of the county is principally west of the Rio Grande. The Gila Forest Reserve includes all the fine timber in the southwestern part of the county, in addition to large areas of agricultural and

grazing land. But even outside of the forest reserve there are virgin forests of pine and other trees in the Frisco, Elk, Black, San Mateo, Magdalena, and Gallina ranges. There are probably 1,000,000 acres in the county covered with merchantable timber. But little has been done thus far to exploit these timber lands.

MOUNTAINS.

The continental divide runs through the county. The mountains of Socorro County are a part of the Rocky Mountain system, which here is splintered into many mountain ranges, groups, and knots, the principal of which are the Oscuras, San Andreas, Tucson, San Mateo, San Francisco, Mogollon, Little Mogollon, Tularosa, Datil, Ladron, Manzano, Socorro, Lemitar, Magdalena, Black Range, and Bear mountains. In most of these mountains there are abundant indications of mineral wealth, which has been developed at but a comparatively few spots.

MINERAL RESOURCES.

It is probably as a producer of mineral wealth that Socorro County is best known. The names of the principal mining districts are Socorro, Water Canyon, Magdalena, Cat Mountain, Rosedale, Black Range, Cooney, Mogollon, Kelly, Oscura, San Andreas, Pueblo, Gallina, Santa Rita, Hansonburg, Abbey, and La Joya. The principal mining camps are Magdalena, Kelly, Rosedale, Mogollon, Cooney, Graham, and Estey City. There are 9 stamp mills, 2 concentrators, and 3 reduction works in the county. The city of Socorro was at one time a great smelter center for New Mexico, although in late years its smelter has been idle. The vast bodies of free-fluxing silver-lead ores in the Kelly and Mogollon districts have become famous in New Mexico's mining history. Large deposits of gold ore, much of it free, in Water Canyon, Rosedale, and in the Black Range, as well as rich copper discoveries in the Black Range, Oscura, and San Andreas mountains, have added to the fame of Socorro County as a mineral producer. Out of the Mogollon district $5,000,000 in gold have been taken and one or two of the best paying mines in New Mexico are in that district despite the fact that it is farther away from railroad facilities than any other mining district in New Mexico and that it became famous first as a silver producer. Several fortunes have been made by the mines at Kelly, 30 miles west of Socorro. Magdalena district, too, has been worked for quite a number of years and has produced a large amount of ore. Yet, the mineral wealth of Socorro County has scarcely been touched. There exist splendid chances for the investment of vast sums of capital and good rewards for the intelligent prospector and miner in every mining district of the county.

The following are the figures given of the gold, silver, and copper production of the Cooney district, Socorro County: The 150 mining locations in the district have produced $5,000,000, one-third of them having shipped ore assaying more than $100 a ton. The Cooney mine alone has produced more than $1,000,000. One shipment of 3 carloads of ore, 30 tons, netted $30,000. Several tons shipped from the Nancy Hanks gave $185 per ton. The Helen Mining Company has taken $1,300,000 out of the district. The Last Chance makes a concentrate that runs from $800 to $1,100 per ton. The Maud S. has

produced $750,000. The Little Fannie has produced $1,250,000; the Grey Hawk $75,000 and the Leap Year $150,000. Thirty-three consecutive carloads of ore from the Cooney returned $121,396.90 net over all treatment and transportation charges.

The Cat Mountain district, situated 12 miles southwest from Magdalena, is a new district, having been developed during the past year. The Socorro Gold Mining Company has developed a gold mine and erected a stamp mill (steel structure, capacity 40 stamps), and will commence dropping 20 stamps the present month.

THE ZINC INDUSTRY.

The mining of zinc in New Mexico has been considered impracticable in the past. The Magdalena camp has been the greatest lead camp in the Territory, and it now bids fair to make as great a record in the production of zinc.

The oxidized lead ores in the Graphic (which has been the greatest lead producer in the camp as well as in the Territory) have been worked almost continuously for the past thirty years down to the 600-foot level, at which point a heavy zinc-lead sulphide ore was encountered, which, until recently, was considered worthless. The mine is now controlled by Fitch & Brown, who have already blocked out 50,000 tons of the zinc-lead sulphide ore, which by experiments in sizing, concentration, and magnetic separation, they are able to work to a good profit. They have also discovered that there are thousands of tons of carbonate of zinc (smithsonite) ore in the old stopes of the mine that is a commercial product, from which they are now shipping 40 tons per day to Missouri and Wisconsin smelters. This is the first carbonate of zinc ore ever shipped from the Magdalenas (or from New Mexico), but it is the beginning of a great factor in the mineral output of the camp, as other mines in the camp are known to have large bodies of the same character of ore.

COAL.

Coal exists in vast quantities in Socorro County, but it is only at Carthage, near San Antonio, that coal is being produced at present. The Carthage mines last year produced 30,000 tons of coal. This year an additional new mine that was opened last year is being worked to its fullest extent and about 150 men are now given employment. In northwestern and southeastern Socorro County there are coal beds from 6 to 12 feet thick. The Southern Pacific Railroad Company lately filed declaratory coal statements upon 15,000 acres of coal lands in northwestern Socorro County.

Onyx, alum, salt, kaolin, besides gold, silver, copper, lead, are among the mineral products of Socorro County, and will some day be great sources of wealth for those who will exploit them.

SCHOOL OF MINES.

The New Mexico School of Mines is doing great work not only for the mineral resources of Socorro County, but of the whole Territory. It offers a course in chemistry, metallurgy, mining and civil engineering equal to that of any other school of mines in the country. Short special courses are also offered, and they have much to commend

themselves to the busy young man or to the prospector and practical miner. The board of regents of the college is striving to make the school the best mining college in the West, and has succeeded so far that no better school of mines is to be found in the Rocky Mountain region. The main building is very substantially built of stone and is modern in every respect. One wing of a new building has been completed to be used as a metallurgical building. The college possesses modern machinery for testing ores and treating them, modern apparatus for assaying, ore furnaces, and other equipments of an up-to-date school of mines. It is well endowed with public lands, the revenue from which, in addition to annual appropriations from the Territory, are used for the maintenance and permanent improvements of the college. The school strives to attract especially the promising young men of the Territory in order to make good chemists, assayers, mine superintendents and managers, and geologists out of them, for there is no more promising field than New Mexico for the trained expert in mining.

RAILROADS.

The Atchison, Topeka and Santa Fe Railroad cuts through the country from north to south, dividing it into two unequal halves. At Socorro a branch line 28 miles long extends to Magdalena. A line from Magdalena to the Black Range is projected and will open a fine mining and stock country to settlement. The projected Colorado and Gulf Railroad from Durango to Clifton, Ariz., or Deming, in Luna County, is to cut through the western part of Socorro County. The line as surveyed is described as follows as far it crosses Socorro County:

After crossing the Sapello in Grant County begin 35 miles of hard country requiring good railroad engineering, the Gila River being crossed several times, but opening up the immensely rich Mogollon mineral district. This grade can be avoided by keeping well up the western slope of the Black Range, turning the Gila, and then resuming the surveyed grade.

There are hills and canyons with plenty of timber, cattle, and also farms until one gets to the V+T ranch. Then follows a stretch of 27 miles of nice, level country well timbered and watered to the west end of the vast St. Augustine plains. Up these plains it is 20 miles to Patterson's ranch, a perfectly level country. From Patterson it is 40 miles to the Rio Camao, crossing a divide of 2.7 per cent grade, passing again through well timbered and watered country with large herds of cattle and sheep. After leaving Patterson's ranch about 8 miles the head of the Tularosa River is struck, the valley extending west 20 miles, with extensive farms and ranches. From the Rio Camao it is 35 miles to the Salt Lake, which covers about a section of land. There is a large outflow of water, clear as crystal, from a crater-like formation. The water settles the salt from an apparently inexhaustible supply. The salt is of good quality, and from a grain of wheat to a hazelnut in size. Thence the route continues north through the beautiful and rich American Valley, with good pasture and abundant water in three places. The line then crosses into Valencia County and on to Gallup, in McKinley County.

The building of the Black Range and of the Colorado and Gulf railroads would double the population of Socorro County in five years, and would vastly increase its output of minerals, timber, live stock, and other products, as well as add materially to the value of its land and mining properties.

THE GRAN QUIVIRA.

In a rolling plain in northeastern Socorro County, near the Lincoln County line, but bare of water, the acme of desolation, lie the ruins of

the Gran Quivira, the theme of many an Indian romance, legend, and story, as well as the speculation of the modern archæologist. The walls of a large building from 3 to 5 feet thick and some 30 feet high, built of blue limestone in a mortar of clay, and the remains of a number of other large buildings, indicate the former presence of a great population. The nearest water is 15 miles away in the Sierra Gallinas, except a small amount obtained from shallow wells within a limited space near the base of the ridge on which the old ruin stands. This water is supposed to be a seepage or accumulation from the surface, and is no doubt held in place by the walls of what was once a large circular reservoir now completely filled and covered by the drifting sands.

Surrounding the Gran Quivira at various distances are the ruins of other towns almost of equal extent. Among these are the ruins of Abo, built of red sandstone embedded in clay mortar, with a town wall surrounding it, part of which, running in one direction, is 950 feet long. Quarra, another Indian town of similar dimensions, was not far distant. All of these have the ruins of churches, showing that at one time the Spaniards held possession. Southerly, extending along the Malpais, from Gran Quivira to Tres Rios, opposite the Sierra Blanca, and in the numerous canyons of this range and of the Sacramento Mountain Range, and in the Salado, were a number of towns and villages, now in ruins, indicating that there must have been concentrated here a population running into the thousands. The strangest feature about nearly all of these towns is the absence of water near them, and in some instances it is many miles off. A casual observer following the general course of the line of towns and villages can reach no other conclusion but that the face of the country has gradually changed since these towns were built and occupied.

The Gran Quivira proper is situated in Socorro County, in the eastern foothills of the Oscura Mountains and about 3 miles west of the Lincoln County line. The ruins of the Abo pueblo and others in that vicinity are in Valencia County, while the ruined pueblos and the Malpais to the south and southeast are in Lincoln County.

The Gran Quivira is easiest reached from the highway running from Santa Fe to Lincoln, and is easy of access from Willard on the Santa Fe Central Railway, about 30 miles distant.

In 1540 Vasquez Coronado, while in search of the far-famed Seven Cities of Cibola, heard of the grand city of Quivira, in the country of the Tagnos, where there were princely palaces, three and four stories high, built of stone, and decorated with jewels; where the roofs were covered with gold and silver, and glittered in the sunlight; where the streets were broad and shaded with trees, the gardens resplendent with flowers, and the women wondrously beautiful, and he determined to visit and conquer it. After a weary tour from Cuiliacan in Mexico, by way of the Rio Gila and the great canyon of the Colorado, he finally reached it. Day by day, as the sun became fervent, and the mirage flattened in the landscape, the magic city was before him. Then it vanished and before him lay a Pueblo Indian town, like the other towns he had visited, and the inhabitants had neither gold nor silver.

Castaneda, who accompanied Coronado's expedition, wrote of it:

> At Quivira, mountains began to be perceived, and it appears to be a well-peopled country, with plants and fruits similar to those of Spain, such as plums, grapes, mulberries, rye grass, oats, flax, etc.

Don Antonio Espejo (1581) says:

Many of the people wore long gowns of cotton tastefully painted, and one of the tribes, the Jumanes, painted the face, arms, and legs. They had great bows and arrows, and sharp cutting swords, with sharp stones on both sides, similar to those of the Aztecs, and they were very expert in the use of the sword and could cut a man in two at one blow. Their shields were covered with untanned bull's hide, and some of the tribes lived in houses of stone four stories high.

Repeated attempts have been made to lift the legendary treasures of the Gran Quivira.

Said Prof. F. A. Jones, of the United States Geological Survey, recently:

A great deal of this section seems to have suffered at some remote period from severe earthquakes, and, in my opinion, there are at present to be found many indications of this fact in old cracks and crevices in the earth's surface, which have, however, been taken by some to be the old beds of rivers which for some reason ceased to flow many hundreds of years ago. I can not accept this theory, and I think that these old lines mark the cracks in the surface caused from severe earthquakes rather than the courses of ancient streams. It is possible that streams in this region have in the remote past been sunk by these earthquake crevices. There are many mistaken ideas of the Aztecs who at some time in the long ago lived in this region. They did not need very much water. Everything indicates that they did not use anything like the amount of water that is used by a civilized man. There are no traces of irrigation ditches, no traces of any storage of water other than embankments built across draws and low places, which acted as a kind of reservoir for the water which was precipitated by the rainfall, though the rainfall in all this region is light, being about the same as that of other parts of Socorro County.

We also visited the ruins at Gran Quivera and some adjacent ruins. At some of these we found what we consider remains of water-storage devices which were constructed of the natural cement found in all of this range, and were told by a native of other ruins some 15 miles distant from Gran Quivera. We made the journey there and were well paid for it by what we saw. It is a ruin heretofore unexplored by the white man—a grand relic of the early civilization which flourished here. It is perhaps one of the most interesting ruins in New Mexico, or in the whole country.

There is now standing the circular ruins of an ancient building, 250 feet in diameter, and with walls about 18 feet high. The work is all plastered on the inside with the cement found in this region. The ruins stand about 6 miles from the little-used road that leads across these mountains, and on the highest point in the region, so that you may see for a considerable distance in all directions. On account of this elevated position, we called the ruins "The Corona," which is appropriate. There is a great amount of the old pottery known as "coiled pottery," which is made by the Indian taking a string of mud and with his fingers winding it around and around similar to the braids in a straw hat. This ruin, "The Corona," is evidently older than the ruin at Gran Quivera, and was probably deserted thousands of years before Columbus discovered America and while the Aztec was only beginning his civilization that afterwards ripened into an intelligence that produced better and more perfect pottery, corn crops, and other things that "The Corona" settlement never knew. The people who built "The Corona" were no doubt the ancestors of the later inhabitants of this region, and of the people who built the other ruins. There is now nothing to indicate how these people got water, or where it came from, as there is no water anywhere near this region, nor anything to suggest that water was ever here, other than the ruins themselves. We did not get any bones from "The Corona," but secured some fairly well preserved specimens at another ruin about 6 miles away.

CLIMATE AND SCENIC ATTRACTIONS.

Like the rest of New Mexico, Socorro County has a peerless climate that is of special benefit to persons suffering from throat and lung trouble. Its summers are never oppressive and its winters are milder than those of the counties to the north, and therefore to be preferred for certain cases of pulmonary complaints. The scenery of the county is beautiful and offers many attractions to the tourist who believes in

traveling off the beaten tourist routes. Ancient ruins, cliff dwellings, canyons, rock formations, forests, life among the cowboys, and in typical Western mining camps, are all had in Socorro County. The water found in the county is good, freer from alkali than in most other New Mexico counties. Some of the springs have health-giving properties, especially the warm springs at Cherryville, at the head of the falls of the Alamosa. They are on the eastern slope of the Black Range at an altitude of 6,540 feet. The temperature of the water is 130°, as is that of a group of springs west of the Gila River, at an altitude of 5,545 feet. These springs are highly mineralized and are specifics for various chronic ailments.

INDUSTRIAL ESTABLISHMENTS.

According to the census of 1900, Socorro County has 25 industrial establishments, with capital amounting to $193,730. Employment is given to 268 men, earning in wages annually $124,835 and producing products worth $517,594. With its big coal deposits and an unlimited supply of raw material, Socorro County should be a good field for industrial investment.

SETTLEMENTS.

Socorro and San Marcial are described under the head of "Cities and towns of New Mexico."

San Antonio is the third town in population in Socorro County, the census giving it 642 inhabitants. It is the center of a farming and stock country. It is situated on the Santa Fe Railroad and is quite a trading center. Eight miles east of the town are the Carthage coal fields.

Kelly is the largest mining camp in Socorro County, and has 616 inhabitants. It is the center of a rich mining region, and has a smelter. Magdalena, another mining and smelting point, is 4 miles north of Kelly, and is the terminus of the Magdalena branch of the Santa Fe Railroad. It is also a shipping point for cattle, sheep, and wool. Its population is 300. The surrounding country is rich in coal, gold, copper, silver, lead, timber, building stone, salt, and onyx.

San Acacia has a newspaper, El Comercio. Mogollon and Cooney are mining camps picturesquely situated in the Gila River forest reserve.

FINANCIAL STATEMENT OF SOCORRO COUNTY.

Total indebtedness of said county up to June 30, 1902, amounts to $191,000, composed of the following items:

Bonded debt.

Date of issue.	Date of maturity.	For what purpose issued.	Rate of interest.	Amount.
	Years.		*Per cent.*	
January, 1897..	10-20	Funding bonds	6	$24,000.00
June, 1901.....	10-20	.....do.....	5	150,000.00
Total bonded indebtedness				174,000.00
Approved bills which are unpaid to June 30, 1902				17,000.00
Total indebtedness to June 30, 1902				191,000.00
Total assessed value of real and personal property for the year 1903				2,086,610.00

TAOS COUNTY.

Area, 2,265 square miles. Population, 13,000; census of 1900, 10,889; census of 1890, 9,868. Assessed valuation, $677,820. County seat, Taos.

Officials.—Commissioners: A. Gusdorf, M. A. Chacon, H. Romero; probate judge, L. Dominguez; probate clerk, T. M. y Gonzales; sheriff, Faustin Trujillo; assessor, A. Santistevan; treasurer, Ramon Sanchez; superintendent of schools, A. B. Trujillo; surveyor, F. Santistevan.

Newspapers.—La Revista de Taos, Spanish and English weekly, Taos. The Red River Prospector, English weekly, Red River. The Mining Reporter, English weekly, Tres Piedras.

Post-offices.—Taos, census 1900, 1,225; Ranches of Taos, census population, 1,407; Llano, 907; Penasco, 887; Arroyo Seco, 772; Questa, 584; Arroyo Hondo, 485; Cerro, 392; Red River, 208; Tres Piedras, 87; Costilla, 63; Ojo Caliente, 59; Midnight, 6, but about 60 at present; Agua de Lobo, Trampas, Twining, Valdez, Pina, Cieneguilla, 119.

Taos is the most picturesque and in many respects one of the richest in mineral resources of New Mexico counties. It is also one of the oldest in point of settlement by white men and one of the best watered sections of the Territory. At one time it included Colorado south of the Arkansas River, Colfax and Mora counties and part of Rio Arriba County, but at present it is the smallest in area of New Mexico counties, excepting Santa Fe and Bernalillo. Yet its area is 1,470,000 acres, or 2,265 square miles, being more than twice the area of the State of Rhode Island and 305 square miles more than the State of Delaware. Of this almost one-half, or 650,000 acres, is open to entry under the Federal land laws; 300,000 acres are still unsurveyed. About 120,000 acres are reserved and 700,000 acres are appropriated, in the past fiscal year 30,589.27 acres having been entered. Considerable of the area is in so-called private land grants, the title of which is clear. The area of the confirmed land grants in the county is about 600,000 acres. The northern part of the Pecos Forest Reserve is also in the county.

It is bounded on the north by Colorado, on the east by Colfax and Mora counties, on the south by Mora and Rio Arriba counties, and on the west by Rio Arriba County.

Taos County is one of the most densely populated of New Mexico counties, but could support five times its present population. It is the eighth county in population. The census of 1900 credits it with 10,889 inhabitants, an increase of 12 per cent during the decade preceding.

The population by precincts was as follows according to the census:

Ranchos de Taos	1,407	Cerro	392
Taos	1,225	Upper Costilla	383
El Llano	907	Red River	208
Penasco	887	Latir	153
Arroyo Seco	772	Cieneguilla	119
Chamisal	704	Picuris Pueblo	98
Placita	685	Tres Piedras	87
Costilla	631	Ojo Caliente	59
Cordova	607	La Belle	49
Questa	584	Amizet	22
Arroyo Hondo	485	Midnight	6
Taos Pueblo	419		

A peculiarity is that its densest population is not along the railroad, but a considerable distance from it.

The taxable assessed valuation of Taos County in 1903 is $677,820, but that this represents but a small portion of its real wealth is shown by the fact that the census of 1900 credits the county with farm values to the amount of $892,000. The same census credits the county with seven manufacturing establishments, which include four flour mills and three ore mills, with an invested capital of $18,000 and a product worth $24,000 per year. Since then the extensive ore reduction and treatment plants of the Fraser Mountain Copper Company have been erected at Twining. The county has 50 miles of narrow gauge railroad and as many miles of telegraph. The low assessment rate makes taxes surprisingly low, although the tax rate may at first thought seem somewhat high.

TOPOGRAPHY.

The Sangre de Cristo Range is the backbone of the county. Its peaks rise to an altitude of over 13,000 feet. From it extend toward the west foothills and the mesa through which the Rio Grande River breaks its way, as well as some fifteen perennial streams which have broken picturesque canyons and mighty gorges or have eroded fertile valleys.

RIVERS.

The Rio Grande flows through it from north to south, but through rocky gorges, hence the cultivated lands of the county are along its tributaries. The county is characterized by the great number of small perennial streams which, rising in high ranges on the east, debouch at about one-third the general width of the district upon the high mesas forming the central and western thirds and flow into the Rio Grande.

The Taos Range, comprising the catchment area from which these streams derive their waters, is unsurpassed in the Territory. It ranges in altitude from 7,000 to 13,000 feet above sea level, with slopes tree-clad and with precipitation greater than in many sections of the Territory.

Beginning at the northern limit and passing south, the first stream reached is the Costilla. This stream passes into Colorado immediately beyond the town of Costilla.

The total irrigation area in New Mexico on that stream is 800 acres, of which 600 are in the canyon and 200 in La Costilla proper. The water supply is ample, not over one-fourth of the flow being used in ordinary years, but scarcity has been felt sometimes in June before the summer rains have brought the rainy season flow.

Passing south, a group of small streams about Cerro is reached. These are the Latir, Rito, Primero, Rito del Medio, and Datil, whose combined flow will not exceed 20 second-feet. A small portion of the Cabresto Creek is also diverted to aid in this section, as the water supply is always scanty. The total irrigable land under ditch around Cerro is 1,500 acres, and at Latir, 450 acres, of which all is under cultivation, or a total acreage for the section of 1,950 acres. There is no surplus water here, all being in use, although the supply might be increased by storage.

To the south is the Rio Colorado with its main tributary, the Cabresto. On this stream the great body of irrigated land is grouped about the junction of the Cabresto with the Rio Colorado at the town of Questa, and water is drawn from both streams. Here there is a large surplus of water, although about one-fourth the normal flow is diverted across a divide into the mountains to Elizabethtown, where it is used for mining. Notwithstanding this loss, only about one-fourth the flow of the streams is diverted for irrigation. The total area under ditch along these streams is about 5,000 acres, for which there is an abundance of water.

A company has been incorporated to build three storage reservoirs on the Cabresto and to bring 30,000 acres of fertile land under irrigation and cultivation. The company is capitalized at $1,000,000, and intends to construct these three reservoirs, one in Cabresto Lake at the Lake Fork of the Cabresto Creek, and a second 1½ miles below the forks of the Cabresto in the main canyon, and the third on the main fork about 200 yards above the junction of the two streams, all three being located in township 29 north, range 13 east. The Cabresto Creek bed is to be cleared and used for a canal to a point about 1½ miles above the mouth of the canyon, at which point the canal shall commence, and from there following around the foot of the hills in a north and west direction to the boundary of the Sangre de Cristo land grant, thence west to the south side of the Ute Mountain. Laterals are to be constructed for the irrigation of lands in townships 29, 30, and 31 north, range 12 east, and in townships 29 and 30 north, range 13 east. South of the Rio Colorado, between it and the Arroyo Hondo, is a tract of land 8 miles wide traversed by several creeks, whose waters are used for irrigation. These are Lerma Canyon, Arroyo San Cristobal, and Agua del Lobo, of which the San Cristobal is the largest. At Lerma Canyon the acreage irrigated is about 40 acres, with no possibility of increase, all the available water being in use. At San Cristobal there are 500 acres actually under ditch and irrigated, but the stream is small and entirely used in serving this body of land, so that it is doubtful if any further increase is possible. At Agua del Lobo there are 250 acres under ditch, all of which are in cultivation. The water supply is scanty, and the greatest care is necessary to carry the irrigation through the month of June.

The Rio Hondo is next in order to the south. This stream lies in a valley of general level of from 400 to 500 feet below the surrounding country, with an average width of about three-fourths of a mile. In the lower valley about the Arroyo Hondo there are 1,500 acres under ditch, of which 1,200 are in actual cultivation. In the upper portion of the valley, about San Antonio, the irrigated acreage is about 300 acres, or a total of 1,500 acres served by the stream. The water supply is abundant, there being at times a heavy surplus, and it is

probable that the irrigable acreage served from this stream could be increased to 3,000 acres at a slight expense, while with storage it is probable that 10,000 acres could be irrigated.

Then comes a group of five streams which water the so-called Taos mesa and uniting form the Taos Creek, which enters the Rio Grande about 12 miles southwest of Taos. These creeks are from north to south—the Seco, Lucero, Pueblo, Fernando, and the Rio Grande de Taos. The Seco is peculiar in that not only is there an entire consumption of its own flow, but the Rio Hondo and the Lucero are also drawn upon to serve its tributary lands. The system is so mixed that it is impossible to assign to each the acreage irrigated by each individual stream, only the total acreage being obtainable. This is 2,600 acres actually cultivated, while 3,500 acres are under ditch.

The entire flow of the Seco is used and no further development here is possible, excepting from increased diversion from the Rio Hondo. No further diversion is possible from the Lucero without a corresponding deprivation of water to the south. The Lucero enters the valley from the north, and waters the land between it and the Pueblo Creek, as well as a tract extending north to the Arroyo Seco. About one-third of the entire flow is diverted toward the Arroyo Seco, while the remainder is used on the lands to the south. The acreage to the south under ditch and irrigated is considered with Pueblo Creek as that to the north has been under the Arroyo Seco. The entire flow of the Lucero is diverted for irrigation and no increase in the irrigable acreage served by this creek is possible, excepting by storage or a more economical use of the water at present diverted. There are several reservoir sites upon the Rio Lucero, by the utilization of which the acreage under this stream could be trebled at a moderate expenditure. Pueblo Creek enters the valley some 2 miles above Taos, and is one of the largest streams in the entire county. The lands along this creek were cultivated by the Indians of the Taos Pueblo a long time prior to the advent of the Spaniards, and in fertility and productiveness are not surpassed in the Territory. The irrigated lands, although practically continuous, are separated into three divisions, known as the Pueblo, La Placita, and Ranchito. At Pueblo de Taos the cultivation is wholly by the Indians, and the acreage is constant from year to year, 1,000 acres being under ditch and irrigated.

At La Placita 3,000 acres are under ditch, but only 2,000 in cultivation, while at Ranchito 2,000 acres are under ditch, with 1,500 acres in cultivation. The total for the stream is 6,000 acres under ditch and 4,500 acres actually irrigated and in cultivation. The water supply is ample, there being a surplus of at least one-third the summer flow at the time when water is most in use and the flow least. The Fernando or Taos Creek enters the valley a short distance below Taos. The amount of land under ditch on this stream is about 2,500 acres, with 2,000 in actual cultivation. The entire flow is used for this purpose, there being no surplus water, and in addition a part of the flow of the Pueblo Creek is diverted to these lands. Scarcity of water occurs in June in years of drought. No further increase is possible on this stream without storage. The Rio Grande de Taos is the most southern stream of those forming the Taos drainage. It has one tributary, the Rio Chiquito, which enters some 2 miles below the head of the valley, and along its banks there is a small amount of irrigated land. In the valley of the Rio Grande de Taos irrigation is practically continuous

on both sides of the creek from the head of the valley to Las Cordovas, its junction with the Taos River. The main body of the land, however, lies in the vicinity of Los Ranchos de Taos. There are 10,000 acres under ditch, of which but 6,000 are in cultivation. The water supply is sufficient for about 12,000 acres in the dry season, when the greatest amount is required, and could be increased by storage.

Embudo Creek is the farthest to the south of all the streams forming the Taos district. Its principal tributaries from north to south are the Rio Pueblo, Rio Penasco, and the Las Trampas. On the Rio Pueblo the land under ditch is 1,600 acres, all of which is in cultivation. Of this acreage the Indians of Picuris pueblo control 600 acres. The water supply is ample, only about one-fourth of the total flow being in use. The Penasco has four centers of irrigation which are, from east to west, Llano Largo, Santa Barbara, Penasco and Rio Lucia. The acreage under ditch and in cultivation is at Llano Largo 800 acres, Santa Barbara 1,000, Penasco 2,000, while at Rio Lucia 800 acres are served, or a total of 4,600 acres from the entire stream. The flow of the Penasco is in excess of the service required, and after El Llano, Chamisal, and all the other demands have been deducted there is still a surplus of about one-fourth the total flow.

On El Llano and Chamisal creeks there are, respectively, 2,500 and 3,000 acres under ditch and in cultivation, but the water supply is short and the Penasco is drawn upon to supply the deficiency. On Las Trampas Creek the acreage under ditch is divided as follows: At El Valle, 500 acres; Las Trampas, 1,500 acres; Vallecito, 100 acres; all of which is under ditch. This, with 300 acres at Ojo Sarco, for which water is diverted from this creek, makes the total of 2,400 acres, with an estimated surplus of one-eighth of the total of the stream. On Embudo Creek, between Las Trampas and its junction with the Rio Grande, the acreage under ditch and in cultivation is 800 acres.

West of the Rio Grande are the Aguage de la Petaca with no agricultural lands along its course in Taos County. The Ojo Caliente, which has large cultivated areas along its course and flows into the Chama River, also flows through Taos County for about 25 miles.

MINING.

Spreading out fan shaped on either side of the main range, and covering a large part of the area of Taos on the west and a large area in Colfax County on the eastern slope, are rugged mountain masses reaching an altitude of 13,000 feet above the sea. As at Cripple Creek, the formation of the entire region is largely the result of volcanic forces, consisting mainly of porphyritic and trachytic dykes and overflows, intersected by innumerable veins or lodes, carrying gold, silver, copper, and iron.

The principal mining districts of northern and eastern Taos County are designated as the Red River, La Belle, Midnight, and Keystone districts, carrying chiefly gold, but showing some silver and copper, and the Black Copper and Rio Hondo, above Twining, both rich in gold, silver, and copper, the latter metal largely predominating in some of the best developed mines. The Copper Mountain or Copper Hill district, near Rinconada, in the southwestern part of the county, contains large bodies of copper ores, carrying some gold and silver.

Mines in these districts are being actively and systematically developed by modern methods and many of them are regularly outputting large quantities of ore that either reward treatment at distant smelters or are profitably milled or concentrated near the mines. Much of the gold ore is free milling and little of it is seriously refractory—the iron content more than offsetting the small percentage of sulphur and other refractory ingredients. The average values are from $10 to $50 per ton, and bodies are frequently encounted that run a great deal higher. Several stamp mills and concentrators are in successful operation in the Red River and La Belle districts. The large bodies of copper ore, carrying some gold and silver, in the Rio Hondo and the Copper Hill districts, yield their values readily to modern concentrating processes, and it seems probable that concentrating will prove an important factor in the future development of the mineral resources of the entire county.

In the Rio Hondo mining district the San Cristobal Copper Company, incorporated under the laws of the State of West Virginia, with a capitalization of $2,500,000, is now developing 20 full-sized claims. Development work has been going on constantly for over two years. An experimental cyanide mill is now on the ground and in operation, and it is expected that before the close of the year a mill will be built with a capacity of 200 tons per day.

At Fraser Mountain, at the head of the Hondo River, 35 miles east of Tres Piedras, on the Denver and Rio Grande Railroad, and 18 miles from the county seat of Taos County, the Fraser Mountain Copper Company has undertaken a most extensive enterprise. This splendid mineral-bearing zone of over 1,200 acres was bought from Wm. Fraser, the original locator of most of the claims, by the Fraser Mountain Copper Company. Good roads have been built all over the property, a number of good houses erected, such as dwellings, boarding houses, and shops. A 15-foot vein of excellent fire clay has been opened, and from this were made the fire brick for the company's extensive plant, which includes an electric plant and smelter. The principal development work is shown in tunnels Nos. 1 and 2 on Fraser Mountain. The former reveals immense bodies of low-grade ore over 10 feet in width, which can be traced on the surface for 3,400 feet. One car lot shipment from this tunnel, treated at a Pueblo, Colo., smelter, yielded 1 ounce in gold, 30 per cent copper, and 20 ounces in silver per ton. Two tons of selected ore from the same vein yielded 35 ounces in gold. Down the mountain 500 feet is tunnel No. 2. Here a tramway is operated, and pay ore is going into the dump every hour of the day and night. The tunnel cuts the mineral formation diagonally, and in driving this tunnel the miners have been in pay ore practically all the way after penetrating the surface wash.

They first cut through a 30-foot dyke of iron assaying $5 in gold. At 200 feet in, a rich quartz vein was gone through, and a little farther on they cut a 6-foot vein of quartz assaying 7 per cent copper, 3 ounces in silver and 60 cents in gold; then they cut a body of good pay ore that is fully 100 feet in width. The returns have been highly satisfactory. The fact is, there is ore everywhere, a veritable mountain of it; the roads and trails are built of it and the creeks and streams cut through it. The immense veins which outcrop so prominently on Fraser Mountain and in which these tunnels and drifts are now being

driven have been opened, and pay ore exposed therein, for a distance of over 7,600 feet, even to the Red River side of the range. The general formation is hydro-mica schist, cut occasionally by great porphyry and iron dykes, the schists being much stratified, with strike to the northeast, and where not broken dip to the north 80 or 90 degrees from the horizontal. The veins dip and strike with the formation, and the vein matter is made up of quartz and schist, both carrying mineral.

It has been estimated by I. M. Gillman, a well-known copper expert who spent a month on Fraser Mountain sampling and assaying ores, that the average value in the exposed bodies was about 7 per cent copper, $4.17 gold, and 5 ounces in silver, and he figured the amount of ore then in sight at 3,880,000 tons, "which can be taken out without the use of hoisting or pumping machinery, and would supply a reduction plant of 500 tons daily capacity for twenty-six years." On this basis, and estimating the price of copper at only 8½ cents per pound, Mr. Gillman calculated that such a mill, run by water power, would yield a daily profit of $5,385. But since these figures were compiled a great deal more development has been done, exposing to view nearly twice the quantity of pay ore.

But this refers only to a fractional part of the Fraser Mountain Copper Company's holdings in this vicinity. In addition the company owns the Cyclone, Empire, Iron Gold, Mossback, and Peerless groups, comprising 640 acres more, and located in the immediate vicinity of Fraser Mountain. Here the veins crop out fully 50 feet in width, and on the surface assay $9.10 per ton gold. At different openings on the surface, assays give $8 in gold, 8 ounces in silver, and 53 per cent in lead. The tunnel is designed to run along the vein 3,500 feet below the surface outcrop, where it is believed a high-grade, self-fluxing gold ore will be found. In the Iron Gold group are very heavy veins of iron, which assay $5 to $8 in gold, and here the principal vein is 12 feet in width.

Water and fuel for generating power and operating all kinds of mining and milling machinery are plentiful. It is hence a safe prediction that the lode mines of the district are certain to prove constant and steadily increasing contributors to the aggregate mineral output of the territory.

A town named Twining, formerly known as Amizet, has sprung up at the mines. A large concentrator is in operation, and a 126-ton smelter has been completed by the Fraser Mountain Copper Company. The concentrator has a product of 3 tons of high concentrates daily. These concentrates will be put into the shape of matte and treated at the smelter. About 70 men are employed in the mines, and as many more at the concentrator and smelter. The mines and smelter are lighted by electricity, and an electric tramway is to be built to the Denver and Rio Grande Railroad at some future date.

The large concentrating and smelting plant of the Fraser Mountain Copper Company, at Twining, is now in constant and successful operation.

Besides the lode mines, there are thousands of acres of valuable placer lands containing tons of rich gold quartz, reduced by the great forces of nature to a condition ready for the application of the hydraulic process, while the beds of the Rio Grande, Red River, Arroyo Hondo, and other streams are natural sluices for many miles,

on the bars of which the gold derived from the wearing away of the gravel banks has been accumulating for ages, and now awaits the application of improved methods to give up its yellow values.

In order to gain an idea of the formation of the placers on the west slope of the main Taos Range, it must be borne in mind that much of the region is covered with an overflow of basalt and other products of eruption of unknown thickness. The Rio Grande has cut a channel through this basalt which, for 40 or 50 miles, is hundreds of feet below the level of the adjacent plateaus. From the eastward the Rio Taos flows through a like canyon for about 8 miles before it joins the Rio Grande. Not only over the great area between these two streams, but extending to the south and east of the Taos, and from the Red River on the north to the Arroyo Hondo on the south, embracing hundreds of square miles and largely resting on the nearly level surface of the basalt, are found some of the largest and richest deposits of auriferous gravel known in the world. The thickness of the deposits varies from 50 to 600 feet, the measured thickness of the Rio Grande gold gravel exceeding the latter figure in many places, or more than three times that of like beds in California, while the average value per cubic yard is believed to be greater than in any other such accumulations yet discovered.

Along the Rio Grande and its tributaries mining operations by means of ground sluicing have been carried on in a small way ever since the locality was first invaded by the Spaniards. Where the Taos joins the Rio Grande evidence of the workings is plainly seen in the ruins of a stone fort and many now nearly filled acequias. In more recent years Americans have followed bar mining on these streams, but the frequency of obstructing rock and difficulty of access because of the great depth of the canyons have been serious obstacles, and, in the absence of systematic efforts to procure the requisite head of water, the greatly elevated deposits of gold-bearing gravel have until recently been neglected. But present indications are that the near future will witness extensive and productive mining operations, both on the river bars and in the higher placer grounds.

An example of the modern and economical method of the treatment of ores is now to be seen at Glenwoody. The Glenwoody Company has an almost inexhaustible supply of low-grade gold ore, which will average about $4.50 per ton. This is treated by the cyanide process in a mill 70 by 170 feet, with a daily capacity of 100 tons. Water power is used, and 120 horsepower is obtained from the Rio Grande through a flume 3,000 feet long. All ore is handled by gravity. The ledge is 75 feet wide and is now exposed for 4,500 feet. The same company is also developing some copper claims not far away, and which promise well, and the ore so far taken out is high grade. In the same district the Green Mountain Mining Company owns five claims, mostly copper, and contemplates the erection of a mill on the same river for the treatment of their ores.

In the Red River country, lying north and west of Elizabethtown, a great deal of capital and American energy have drifted in during the past few years, or since the nullification of the principal grant claims in that region. Red River mining camp is situated on an ideal town site in a beautiful valley surrounded by mountains of ore that carry large quantities of gold, silver, lead, copper, and zinc. The district is well watered and well timbered, and the climate is ideal, despite the eleva-

tion of 8,600 feet, the winters being almost as mild as those of Santa Fe. There are about 20 patented mining groups in the camp, and about 20 more are to be patented in the near future. Some of the mines are well developed, the Union tunnel being in 1,800 feet and the Inferno being down 1,100 feet. The ore values are good, but, owing to the great cost of taking ore overland to the nearest railroad point, it does not pay to send anything less than $60 ore.

With the coming of a railroad all this will be changed, and the camp instead of employing a hundred men will employ a thousand and more. There is little doubt that the building of the proposed Fort Garland-Taos-Santa Fe Railway would make the Red River district one of the greatest producers of ore in the Southwest, which would furnish an immense tonnage to the railroad. Despite its distance from rail communication, the camp has been enjoying a steady, healthy growth of late years, and while its people do not look forward to and do not particularly care to have a big boom, they are confident that Red River is bound to be one of the most prosperous mining towns in the country. Gold, copper, silver, and rich placers abound. Nuggets running as high as $4 and 22 carats fine have been washed out of the iron placers near Red River. Among the rich lode propositions are the Memphis, Jay Hawk, Copper Belle, Waterbury, Mineral King, Shoshone, Black Copper, Scarlet, Golden Treasure, Banker, Gold Bug, Gold Coin, Silva, Tom Thumb, Homestake, Willard, Stella, Little Abe, Old Timer, Midnight, Edison, Ragged Pants Dick, Lone Star, and Cora Gibson claims. The latter has a tunnel in 140 feet. The Memphis shows a strong vein of sugar-loaf quartz 3 to 5 feet in thickness, very uniform in character, and running $30 to the ton. The vein has been cut by a tunnel 200 feet below the original workings. The inclosing walls are a light-blue porphyry, free milling in its character. Cleveland, St. Louis, Kansas City, Colorado, and Pittsburg capitalists are largely interested in claims in this locality and are displaying their confidence by a wise and liberal expenditure in development work. The Anaconda group covers an immense body of gold-copper ore that has been exposed in tunnels for 600 feet. This promises to prove one of the copper bonanzas of the Southwest. The Willard is another valuable property, on which a tunnel is now in 300 feet and will cut the vein at 500 feet. The vein is 6 feet wide and carries chiefly gold values. A railroad through this region is the great need of the hour, but at the present determined rate of development the district can not remain long without ample shipping facilities. The mills in this district are the June Bug Company's 80-ton amalgamation plant, the Black Copper 30-stamp mill, the Edison 20-stamp mill, and other minor plants.

In the Red River mining district the Jayhawk Mining Company has erected a concentrating plant with a daily capacity of 40 tons.

A wagon road is nearly completed up Placer Creek. This road is built to give access to several promising prospects in that part of the camp. The Jayhawk and Scarlet have considerable ore on their dumps ready to be hauled to the Jayhawk concentrating mill at Red River as soon as the road is completed.

A force of men are at work on the Jayhawk and are now taking out some good ore. They recently cut into what they believe to be the main vein. If this proves to be the case and the values hold out as hoped, the owners will probably put in a new plant at the mine for the

exclusive treatment of their own ores, leaving their present concentration mill down on the river for custom work. They have 50 acres of patented and 20 acres of unpatented ground in a good region. Their ores are gold and silver bearing, gold values largely predominating, and partly free milling.

The Scarlet is another good prospect, showing assays up to 25 ounces in gold per ton. This property is owned by Waco, Tex., people, who have applied for a patent survey.

The owners of the Victor group have caught their lead and are getting some good copper-lead ore.

In the Anchor mining district the Cashier Mining and Milling Company has four claims in process of patenting and all contain good values in gold and silver. It has over a thousand feet of development and a steam hoisting and pumping plant. The Edison claim, patented, has erected a 10-stamp mill for the treatment of its ore, which runs well in gold. The Memphis mine has about 500 feet of development and carries good values in gold and silver. This property has no mill, but from numerous mill and smelter tests on large quantities of ore is believed to be one of the best properties in the district. The claims are in process of being patented. The Midnight group has a 10-ton Kincaid mill on five patented claims and also a steam hoist and pumping plant. The Golden Treasure has spent about $10,000 in development work and has developed a good vein that runs well in gold.

AGRICULTURE.

Agriculture is the oldest industry, and for many years Taos County was the granary of New Nexico. About 20,000 acres are under cultivation, but this area can be doubled with existing irrigation facilities and increased to 200,000 acres by building storage reservoirs and modern irrigation systems, a number of which are being planned at present. Land under ditch can be purchased very cheaply. Agriculture is still being carried on in most parts with primitive implements and in primitive ways. Part of the soil under cultivation has been giving crops annually for centuries, and the use of fertilizers is practically unknown, for the sediment from the irrigation waters yield all the fertilizing elements needed. The soil in the valleys is a dark loam, very deep and especially conducive to the growth of wheat. The wheat raised is of superior quality and yields 30 bushels to the acre, 65 to 68 pounds per bushel, on the older lands, and 50 to 60 bushels per acre on virgin soil. The grain is exceedingly large and plump. There are four flour mills in the county, one of them at Taos being a modern roller mill with 75 barrels a day capacity. Oats yield 40 bushels to the acre, rye 15 bushels, and barley also does very well. Corn yields a good crop, and so do broom corn, alfalfa, timothy, beets, beans, turnips, pumpkins, squash, melons, cantaloupes, chili, and so, in fact, all vegetables common to the temperate zone. Cabbages weighing 50 to 70 pounds are not rare. The beans raised are of a superior quality, being much sweeter than the common white bean. Grasses grow luxuriantly. The fruit raised in Taos County is fine, especially in the valleys below an altitude of 7,000 feet. Apples, pears, plums, peaches, cherries, and small fruits attain a size, flavor, and yield that invariably astonish even the visitors from the California fruit belts.

There is room in Taos County for the progressive farmer who will

do better there, probably, than in any other part of the southwest. There is a home market for all the products that are being raised; in fact, thousands of dollars worth of agricultural products, including poultry, eggs, butter, and meat, are brought into the county from eastern points.

The present outlook is for an abundant crop of all cereals and fruits, as well as an increased acreage under cultivation. The increase of acreage under cultivation is especially noted in alfalfa. There is also a noted increase in immigration, and the newcomers bring great improvements in methods of farming and in buildings. There is also a movement toward getting the land together in larger bodies and the use of machinery. Especially notable is the large number of fruit trees set out the last year in good-sized tracts and others in small orchards.

STOCK INDUSTRY.

The sheep industry, next to agriculture, is the most important. About 200,000 sheep graze on the free range. On account of the comparatively mild, dry winters, the luxuriant growth of wild grasses, and the abundance of water, stock raising is very profitable. There are about 10,000 goats, the mountainous sections affording ideal range for them. There are about 5,000 head of cattle, and there is ample room for expansion right here, especially along the lines of dairying, creameries, and cheese factories. Hogs are raised successfully and Taos County is an ideal section for the fattening of lambs and beeves. Bees do well and offer the advantage of a substantial side income to the farmer.

CLIMATE AND HEALTH RESORTS.

Too much can not be said about the climate of Taos County. With that of Santa Fe County it is the best in New Mexico, and that means in the world. Mild winters, cool summers, dry, antiseptic air, a salubrious altitude, and the fragrance and healing odor of pines, spruce, and pinon combine to make Taos County the ideal place for health seekers, especially those suffering from lung and throat trouble. Bright, sunshiny days prevail, while the nights are uniformly cool. The roads are good for driving, riding, and bicycling. Fishing and hunting are unexcelled. In fact it is the ideal place for one who wishes to recuperate. The climate and drainage are perfect. Typhoid and malaria are unknown, and it seems to be a country of longevity. Here one sees many men and women from 80 to 100 years old. Acute diseases are almost unknown. It is a safe estimate to say that there are over 300 sunshiny days in the year. The tourist and health seeker find here many things to interest them, particularly the Taos pueblo, called by Charles F. Lummis "The American Pyramids." Here one can study the customs of centuries ago, folklore tales, and try to fathom the secrets of the "kivas" or council chambers, and many ceremonial functions and mystic dances. Here one can find rest from the daily monotony and grind of an active life and recuperate his gray matter. No finer place for a summer outing can be found. There are many hot springs scattered throughout the county, affording convenient opportunities to indulge in the luxury of refreshing and restoring baths.

The volcanic nature of this part of New Mexico is shown by the igneous rock formations, the lava beds, and the hot springs which are

found in various parts of the county, the principal ones being those at Ojo Caliente on the border of Rio Arriba County and Wamsleys Hot Springs near the Rio Grande River.

The Ojo Caliente Springs are one of the most remarkable groups of thermal springs in the world. They are situated at an elevation of 6,290 feet above sea level. This group, consisting of four large hot springs, was discovered and named Ojo Caliente by Cabeza de Vaca in 1534. While searching for the "Seven Cities of Cibola," this celebrated Spanish explorer had his attention called to these springs by the natives, who informed him that for many years these medicinal waters had permanently cured many chronic diseases of the adjacent Indian tribes.

Apparently many races used these waters, as the several distinct classes of architecture and buildings found among the ruins near the springs show different periods of habitation. In connection it may be remarked that the remains of men have been unearthed there whose skulls are of entirely different shape from those of earliest man. Regarding the Cliff Dwellers, who built the surrounding ruined cities and used these waters, very little is known.

For centuries traditions have been handed down by the surrounding Indian tribes regarding the efficacy of the waters of these springs, some of the reported cures bordering on the marvelous; and now every year all the neighboring tribes—as they have done for centuries—visit Ojo Caliente, bringing their sick for treatment, and build for themselves little brush houses along the valley, and proceed to take the volcanic cure. On their departure for home they carry away with them the evaporated salts and in their distant mountain homes artificially reproduce the wonderful sweating effect caused by bathing in and drinking of the waters. They, in their simple way, know that the action of the water purifies the blood and clears the pores of the skin of impurities; by experience they have learned a method of curing disease by the use of the salts.

European history of the use of these waters necessarily commences at the date of Vaca's first visit to the springs in 1534, and he carried a description of their wonderful virtues to the Spanish army in the City of Mexico. It is said that his report of the volcanic springs created the greatest excitement among the disease-stricken soldiers, and 1541 witnessed many Spanish soldiers taking this "volcanic cure." In 1590 a terrible blood disease, spread by the Spanish soldiers, was raging among the Indians with such fury, and the number of sufferers camping out at the springs was so great, that the Spanish priests in their zeal to spread Catholicism, built at Ojo Caliente, in the autumn of 1590, a church which stands to-day in a perfect state of preservation. The deadly blood poison raged among the Indians for ten years, even reaching a form of leprosy, but the persistent use of the volcanic springs finally mastered it.

The number of marvelous cures performed by these waters will, of course, never be known, for then, as now, this awful blood affliction carried with it numerous other diseases.

As near as can be learned, the volcanic springs were first visited by Americans in 1810. Since that time there is direct American evidence of the wonderful powers of these waters, and for many years it has been the practice of the residents of the western towns and settlements, when afflicted with serious disorders of the blood, rheumatism, or paralysis, to manage in some way to reach the volcanic springs,

carrying with them their camping outfits, and bathing in the most primitive bath tubs. In 1870, when the hot springs of Arkansas began to attract universal attention, the volcanic springs were 500 miles from the nearest railway station, among mountains and hostile Indians, and a physician at the springs as a resident adviser was never dreamed of. Patients suffering with all forms of disease simply took their chances with nature. It was drink and bathe and wait for nature to relieve.

Not longer than twenty-two years ago invalids were forced to content themselves with virtually the same primitive surroundings as the races long since dead. Yet the most astonishing cures were performed without the aid of doctor or medicines.

The fact that the title to the volcanic springs was clouded by their location on an unconfirmed Spanish grant, together with their remoteness from railways, long prevented the construction there of the hotels and bath houses that the recognized merits of the waters justified. But these obstacles have been removed. After twenty-five years of litigation the title of the Ojo Caliente grant, embracing the volcanic springs, has been confirmed to Hon. Antonio Joseph by the United States Court of Private Land Claims, and the springs can now be conveniently reached by way of the Denver and Rio Grande Railway and the Santa Fe route. A good hotel, well-equipped bath houses, and numerous cottages have been provided for the accommodation of guests, and the erection of another large hotel, equal to the finest in the land, is contemplated.

Ojo Caliente is located very near the thirty-sixth parallel of latitude, 25 miles west of Taos, 50 miles north of Santa Fe, and 12 miles from Barranca station on the Denver and Rio Grande Railroad, from which point the health shrine is reached by means of a daily stage line. The volcanic springs are three in number; their daily flow is over 300,000 gallons; the temperature of the waters is from 90 to 122° F.; the gases are carbonic. The waters from the largest of these springs contain 1,686.84 grains of alkaline salts to the gallon, being the richest alkaline springs in the world. An analysis of the water shows a total of 288.09 parts in 100,000, divided as follows:

Sodium carbonate	195.95	Arsenic	10.08
Calcium carbonate	4.20	Lithium carbonate	1.22
Iron carbonate	20.12	Magnesium carbonate	6.10
Sodium chloride	40.03	Silicic acid	4.10

The ingredients of the famous Lithia springs, closely associated with the other hot springs of the group, the waters of which are not only thirst quenching and palatable, but specially adapted to the cure of kidney troubles, are given by the chief chemist of the United States Geological Survey, acting under authority of the Interior Department, as follows:

Lithium chloride	20.9	Calcium carbonate	43.0
Potassium chloride	59.9	Strontium carbonate	2.4
Sodium chloride	305.5	Barium carbonate	Trace.
Potassium iodide	Trace.	Magnesium carbonate	33.2
Sodium arsenate	Trace.	Silica	60.2
Sodium borate	5.4	Iron oxide	1.6
Sodium nitrate	Trace.	Alumina	.5
Sodium sulphate	223.3	Carbonic oxide	775.6
Sodium carbonate	1,846.9	Calcium phosphate	.3
Ammonium carbonate	Trace.		
Calcium phosphate	.3		3,389.4
Calcium fluoride	43.0		

The waters of Wamsley's Hot Springs are also gaining a reputation for their curative effects that is bound to bring hundreds of health seekers. A fine toll road has been constructed to the springs, and a modern hotel is to be built at them in the near future. Near here a toll bridge has been built across the Rio Grande.

RAILROADS AND HIGHWAYS.

Taos County has meager railroad facilities. The Denver and Rio Grande has not quite 50 miles of narrow-gauge tracks in the extreme western part of the county, near the Rio Arriba boundary line, but Tres Piedras is the only settlement it touches, although there is also a station for Embudo, a settlement several miles from the railroad. However, the scenery along this railroad, especially from Embudo to Barranca, is among the grandest in the Southwest. From Embudo and Tres Piedras stations to Taos there are excellent roads with daily stage lines, while the mining camps of Red River and Amizet and the settlements of Cerro and Questa also have good road connections, as have to a lesser extent all the post-offices in the county.

Recently a new road has been constructed from Taos to Servietta, on the Denver and Rio Grande Railroad, making the distance from the county seat to the railroad only 22 miles, and the Denver and Rio Grande Railroad has built a fine new depot at Servietta.

But the principal settlements of the county will not much longer be without railroad facilities. Construction will soon commence on the Cimarron River and Taos Valley Railroad, which will start at Maxwell City, a station in Colfax County, on the Atchison, Topeka and Santa Fe Railway, and will follow the Cimarron and Moreno rivers to Elizabethtown and Red River to Taos, and eventually to Ojo Caliente. This line was surveyed many years ago, and of the survey through the county, Prof. F. A. Jones, who had charge of the survey, speaks as follows:

Across the range, about 10 miles west of Elizabethtown, is the Amizet mining district, which shows many mines of high-grade ores in copper, gold, silver, and lead.

From the gateway of the Moreno Valley our projected line of railway reached south and west, crossing the main range at an elevation of exactly 9,000 feet, at a point known as the Taos Pass.

The grade in going down the mountain on the Taos side is gradual and easy.

The Taos Valley is the most beautiful part of New Mexico. The soil is fertile, producing wheat, rye, corn, alfalfa, vegetables, and fruits of all kinds. This valley was formerly the Egypt of New Mexico; it was the Mecca to which the whole Southwest journeyed as Benjamin of old to buy corn in years of drouth and famine.

The old town of Taos is practically to-day as it was centuries ago; to see the inhabitants toiling in the gardens and fields carries us back to the time of Moses, as did the children toil upon the plains of Shinar.

Some very old ruins, presumably Pueblo, are to be seen to the right when nearing the main town. There are no legends as to by whom these ruins were inhabited.

An interesting feature is one of the churches of the Pueblo Indians at Taos. It appears that these Indians rebelled against the United States Government once, and but only once, in the latter part of the fifties, and took refuge in this old church, whereupon Gen. Sterling Price bombarded them with cannon from a distant point until the Indians hoisted a flag of truce from the top of the old church. The effect of that bombardment was in evidence at the time of the survey in 1893. The holes made by the shells were never repaired.

The writer shall never forget the time when the corps of surveyors entered the suburbs of the town. They were met by all the prominent people of Taos with music, song, and general welcome. We were feasted and toasted, given receptions and entertainments every night while there. This act of appreciation in welcoming us into their homes and places of amusement was entirely due to the native people

of Taos, for there was but one Anglo-Saxon family living there at the time. It is in one of the cemeteries of Taos where lies all that is mortal of America's greatest hunter, trapper, scout, and guide, Kit Carson.

From Taos the line of survey ran in a southwesterly course down the boxed canyon of the Taos River to the Rio Grande.

A line of railway built over this route would open up the garden spot and storehouse of New Mexico's choicest possessions.

The entire line could be constructed at comparatively small cost, and on a grade not to exceed 2½ per cent.

The Fraser Mountain Copper Company contemplates building an electric railway from Twining to Wamsleys Hot Springs and a connection with the Denver and Rio Grande Railroad. The latter railroad company may also sooner or later build over the mesa from Tres Piedras down into the Taos Valley and then up to Red River. Another very feasible railroad project has been broached, it being a line from Fort Garland, on the Denver and Rio Grande Railroad in Colorado, to Embudo, on the same line in Taos County. Such a line would strike first San Luis, Colorado, then Costilla, San Pablo, San Jacinto, Manzanares, Latir, Youngtown, La Belle, Cerro, Questa, Rio Colorado, San Cristobal, Agua de Lobo, Valdez, Rio Hondo, Arroyo Seco, Taos, Penasco, etc., and will shorten the line 66 miles over the present route to Santa Fe. From Questa south an abundance of fine timber exists, and directly adjoining such a line on the east are the very promising mining districts of Twining, Amizet, and San Cristobal.

The larger settlements on the proposed line from Fort Garland to Taos contain over 20,000 inhabitants. The line would cross ten or more fertile river valleys, and almost the entire distance it would pass through farming lands of great value.

TIMBER.

Portions of Taos County are heavily timbered, and, in general, the county is the best timbered in the Territory. On account of the difficulty in bringing the merchantable timber from the steep mountain sides to the railroad, sawmills are in operation in various parts of the county, the principal being near Questa and Twining.

INDUSTRIAL OPPORTUNITIES.

Taos County is bound to be one of the richest sections of New Mexico. It will be but a few years before the price of its agricultural lands will double. The cheap power which the upper course of its streams and the Rio Grande, which has a considerable fall and a large flow in the county, afford, mark it as a future industrial district, especially when it is considered that the magnificent coal fields of Colfax, Santa Fe, and Rio Arriba counties are so near and the abundance of minerals, as well as the sheep and cattle industries and agriculture, can furnish the raw material for a hundred and more industrial establishments. A beet-sugar factory should be one of the first new industries to be established, for the Taos Valley can raise better sugar beets than any other part of the world, excepting Santa Fe, San Juan, Rio Grande, and San Luis valleys. The construction of irrigation works offers special inducements to capital, as do the building of railroads and the development of the truly astonishing mineral resources of the county. But not only the capitalist and the promoter will find a rich field for exploitation,

but also the small farmers, the fruit raiser, the prospector, and the man with brains and moderate means who comes to establish lesser industries, such as flour mills, tanneries, scouring plants, etc.

SCHOOLS.

The public school system of Taos County is showing great improvement of late years. There are 31 public school districts in the county, each with a schoolhouse, which last year employed 33 teachers and were attended by 1,603 pupils. At Taos there is a Loretto academy and a Methodist mission school; at Taos, Ranchos de Taos, Prado de Taos, Arroyo Seco, Arroyo Hondo, Embudo, and Penasco are Presbyterian mission schools, and at Taos and Picuris pueblos there are Government day schools. Each settlement has its Roman Catholic Church, while at a number of places there are Methodist and Presbyterian mission churches.

SETTLEMENTS.

A description of Fernando de Taos and Ranches de Taos is given under the head of "Cities and towns of New Mexico."

Red River is a beautifully situated mining camp with about 300 population, a good public school, and a weekly newspaper—the Red River Prospector. The population is increasing and enterprising.

Tres Piedras is a railroad, mining, and lumber town on the Denver and Rio Grande Railroad, and a distributing point for the Las Tusas, Bromide, and Good Hope mining districts in Rio Arriba County, and the terminus of a daily stage line from Taos. A newspaper—the Mining Reporter—is published here.

Embudo is a prosperous agricultural settlement on the Rio Grande, beautifully situated at the foot of high mountains. It has a railroad station several miles south of it, from where a daily stage line for Taos, Twining, and other points starts. It has a public school and a mission school.

Twining, formerly Amizet, is a prosperous mining camp, with several hundred inhabitants. It is the headquarters of the Fraser Mountain Mining Company, which carries on the most extensive mining operations in the county. The mill, smelter, electric power and light works, offices, etc., of this mining company are situated here.

Questa and Cerro are progressive and prosperous agricultural settlements. Costilla, Pina, Agua de Lobo, Arroyo Hondo, Arroyo Seco, Llano, Trampas, and Penasco are agricultural settlements surrounded by fertile lands under irrigation. Picuris is a quiet Indian pueblo with a population of 100.

ATTRACTIONS FOR TOURISTS.

Taos County is well worth a visit by the tourist. No visitor can fail to be charmed by its blue skies, its balmy, soothing climate, its invigorating air, rare sunshine, the entrancing beauty of its valleys, the sparkle of its streams, the grandeur and magnificent ruggedness of its canyons and gorges, and the majesty of its mountain scenery. For those who love fishing or hunting, Taos County is a paradise. The Indian pueblos, the prehistoric ruins, the quaint settlements, and the mines of gold, copper, and lead are all interesting.

FINANCIAL STATEMENT OF TAOS COUNTY.

The total indebtedness of Taos County, up to and including June 30, 1903, is as follows:

June 6, 1889, 10–30 funding	$24,500
July 2, 1889, 10–30 current expenses	3,000
July 1, 1892, 15–30 current expenses	3,500
August 2, 1897, 10–20 current expenses	10,400
Total	41,400

Total value assessed real and personal property, $677,820.

UNION COUNTY.

Area, 6,037 square miles. Population, census of 1900, 4,528. Since then the county has given 265 square miles to the formation of Quay County. Its present population is 6,500. Assessed valuation, $2,021,640. County seat, Clayton.

Officials.—Commissioners, C. Otto, J. B. Montoya, E. Gallegos; probate judge, E. Lobato; probate clerk, R. P. Martinez; sheriff, P. Baca y Sanchez; assessor, L. Vigil; treasurer, J. M. Gonzales; superintendent of schools, L. Castillo; surveyor, F. Garcia.

Newspapers.—The Clayton Enterprise, Clayton; El Fenix, Clayton; Independente, Folsom.

Post-offices.—Clayton, Folsom, Albert, Barney, Beenham, Bueyeros, Clapham, Dehaven, Exter, Leon, Miera, Pasamonte, Telesforo, Veda, Cuates, Gladstone, Logan, NaraVisa, Gallegos, Bryantine.

Union County, the northeastern county of New Mexico, was formed in 1893 out of portions of Colfax, Mora, and San Miguel counties. It is bounded on the north by Colorado, on the east by Oklahoma and the Panhandle of Texas, on the south by Quay and San Miguel counties, on the west by San Miguel, Mora, and Colfax counties. This county has an area of 6,037 square miles, it being the seventh county in size in New Mexico, and the seventeenth in population. It is more than five times as large as Rhode Island, three times as large as Delaware, one and one-half times as large as Connecticut, and as large as the Hawaiian Islands. Of its area only 727,000 acres have been appropriated, while 3,140,000 acres are still subject to entry under the United States land laws or to leases from the Territorial land board, which controls large tracts in Union County under the United States donations to the Territorial institutions and the public schools. During the fiscal year ending June 30, 1903, there were entered in Union County 262,559 acres of public land, 142,690 acres of this as homesteads and 6,438 acres under the desert-land act.

The census of 1900 gives the county a population of 4,528, which during the past two years has increased to 6,500, and is still rapidly growing, owing to the recent construction of the Chicago, Rock Island and Pacific Railroad system through the southern part of the county. The population of the county, by precincts, was as follows, according to the census of 1900:

Clayton	750	Baca	239
Cimarron	810	Albert	179
Folsom	297	Mosquero	163
Gladstone	194	Gallegos	155
Romero	226	Alamosa	108
Miera	450	Canadian	99
Clapham	337	Garcia	195
La Ceja	326		

According to the assessment made in 1903 the county's valuation was $2,021,640, but the census of 1900 has it that the value of all farm

property in the county, including stock, alone was $4,664,000, only two other counties in the Territory exceeding Union County in that respect. There are according to the best estimates 600,000 sheep in the county, 60,000 cattle, 4,000 horses, 5,000 goats, and 1,000 mules. The census credits the county with seven small manufacturing establishments with an invested capital of $11,000 and an annual product of $12,350. The total indebtedness is only $18,000, and on account of a low rate of assessment taxes are not high.

The county is in the drainage area of the Canadian River, which, with the Cimarron and Ute Creek, constitute the principal streams. Small streams, partly dry the greater part of the year, except where springs and water holes exist in the river course, are the Currampaw, Traversier, Cienquilla del Burro, Rabbit Ear, Perico, Carriso, Mayor Long's Creek, Tramperas, Del Muerto, Don Carlos, Palo Blanco, Nevict, Teques Quiet, Monia, and Plaza Largo. There are a number of lofty mountain peaks in the county, several of them of volcanic origin, and the first foothills of the Rocky Mountain system, but no prominent mountain ranges. The county slopes toward the southeast and consists of a number of high mesas, extensive plains, and narrow river valleys and canyons.

THE PRINCIPAL INDUSTRY.

Stock raising is the principal industry and the source of its wealth. Union County is one vast range, ideally adapted to the cattle and the sheep raiser. The mild winters, the free range, and the nourishing grasses make stock raising very profitable in this part of New Mexico. Of the 60,000 cattle on the range many are a good grade of Herefords, and a number of model stock farms are to be found in the county. The number of sheep exceeds 600,000, the county leading all other counties in the Territory in the sheep industry. At Clayton, the county seat, 3,000,000 pounds of wool are sold annually, while buyers of lambs for feeding purposes make frequent visits to Clayton and Folsom. Each year 100,000 lambs are shipped out of the county to Fort Collins and other Colorado points, where they are fed for market. The wool crop annually approximates 3,000,000 pounds. Of late years quite a number of cattlemen have been raising alfalfa on a small scale for feeding purposes. The river bottoms, especially along the Cimarron, are used for that purpose, and altogether about 2,000 acres have been put under cultivation. The sheep growers will undoubtedly soon follow this example. The cattlemen are rapidly improving their stock by importing registered cattle from the States.

The raising of goats is a growing industry as well as the raising of horses for market, both proving very profitable and the county being especially adapted to them. The three railroads of the county afford good facilities for the shipment of stock.

AGRICULTURE.

Owing to the lack of storage reservoirs and extensive irrigation systems but a few thousand acres in the county are under cultivation. Wherever water is available, however, for irrigation purposes, crops of grain, vegetables, and fruit can be raised with unvarying annual success. There are a number of orchards in the county in which every variety of fruit of the Temperate Zone is raised. Wild

fruits and nuts grow in abundance along the streams and on the mountain slopes. If the flood waters which rush down the rivers at certain seasons were stored, fully 100,000 acres could be brought under cultivation. Many natural reservoir sites exist. Ten miles west of Folsom commences the Johnson mesa, 8,000 feet high, extending into Colfax County almost to Raton, on which fine potatoes are raised, also large crops of oats. Every agricultural product indigenous to the Temperate Zone is raised on this mesa, excepting corn. No irrigation is necessary over a great extent of this mesa, and for the fifteen years that it has been cultivated no crop failure has been known. Two fine school buildings and a church have been built by the 500 people living on the mesa, which is altogether under cultivation, but on which land can be bought cheaply. Alfalfa is an especially profitable crop on account of the extensive stock interests. The soil of the county is generally of a sandy loam nature and needs but the touch of water to make it the most fertile land in the West.

The county has some timber lands which thus far have been practically unexploited.

MINING.

Mining is in its infancy in this county, but there are undoubted indications of gold, silver, copper, and lead in various precincts. In the northeastern part, near the Oklahoma and Colorado lines, considerable development work has been done on a number of copper prospects. Gold has been mined near Folsom, but not in any systematic or extensive manner. Coal deposits exist in the northern part, the veins being an extension of the Trinidad fields in Colorado. A good grade of bituminous coal exists near Clayton, and development work is being done in a desultory way. The distance from the railroad alone prevents the prospects near Clayton from becoming large producers of coal. Coal veins also underlie Johnson's mesa.

Indications of oil can be pointed out along many streams, and often in drilling for water very promising oil indications are struck. Very fine mineral springs are found in the county, and there is but little doubt that artesian water will be struck at a moderate depth. On Ute Creek are deposits of pure alum, while excellent lime quarries are found and worked near Folsom.

RAILROADS.

The Colorado and Southern Railroad crosses the northeastern corner of the county for a distance of 84 miles. The Chicago, Rock Island and Pacific Railroad passes through the southern part of the county for a distance of 56 miles, opening a new country to development and settlement. A branch of the Chicago, Rock Island and Pacific Railway has been completed to the Dawson coal fields from Tucumcari, opening up this wonderful deposit and giving it a market. These railroads will naturally prove great factors in settling up this section, and the growth of the older towns as well as the founding of new settlements are assured. The bridge of the Rock Island over the Canadian River is considered one of the engineering wonders of New Mexico. It is 759 feet in length and spans the river 135 feet above its bed. There are 140 miles of telegraph lines.

CLIMATE AND ATTRACTIONS FOR TOURISTS.

The climate of Union County is as perfect as is to be found in the United States. The altitude, ranging from 4,000 to 8,000 feet, gives the air a lightness that is especially beneficial in pulmonary troubles. The nights are always cool, and the summer heat is moderated by the altitude as well as the cool breezes from the mountains, while the cold in winter is tempered by the constant sunshine and protection which the mountains afford from high winds. The numerous mineral springs will help to make Union County famous as a health resort. Fine mountain views, deep canyons, charming valley vistas, and rugged rock formations are attractions that nature has provided. Game in abundance, such as bear, deer, antelope, gray wolves, badgers, coyotes, foxes, rabbits, squirrels, etc., is found.

A description of the county seat of Clayton and of Folsom are given under the head of "Cities and towns of New Mexico."

Logan is a new town in the southern part of the county, on the Rock Island Railroad. It already has several business houses, and promises to become quite a business center.

The only other settlement of any size in the county is Bueyeros, with a population of 300, a fine Catholic church, and lying in a broad valley underneath the Black Hills mesa. It is the center of a rich grazing country.

Union County offers many inducements to the settler who has a small capital to tide him over the first year or two, until he has established himself. To the man with ample capital it offers splendid opportunities for profitable investment. There can be no doubt that the county is destined to become one of the wealthiest and most populous counties of New Mexico.

FINANCIAL STATEMENT OF UNION COUNTY.

The total indebtedness of the said county up to and including June 30, 1903, amounts to $46,831.41.

Date of issue.	Date of maturity.	For what purpose issued.	Rate of interest.	Amount.
	Years.		*Per cent.*	
November 21, 1894	10–20	Court-house and jail	6	$20,000.00
January 15, 1895	15–30	Current expenses	6	4,000.00
March 1, 1900	10–20	Refunding bonds	4	14,500.00
		Outstanding indebtedness		5,331.41
Total indebtedness				46,831.41
Total assessed value, real and personal, for the year ending June 30, 1903				2,021,640.00

VALENCIA COUNTY.

Area, 7,944 square miles. Population, census of 1900, 13,895; present population, 18,000. Assessed valuation, $1,359,786. County seat, Los Lunas.

Officials.—Commissioners: A. Padilla, R. Jaramiilo, R. Garcia; probate judge, H. Chaves; probate clerk, D. Vallejos; sheriff, Carlos Baca; assessor, B. W. Bibo; treasurer, S. Luna; superintendent of schools, J. C. Sanchez; surveyor, R. C. Marmon.

Post-offices.—Belen, Los Lunas, Jarales, Peralta, Tome, Valencia, Publitos, Duran, Pinos Wells, Mountainair, Amado, Bluewater, Copperton, Cubero, Grant, Laguna, Marquez, San Mateo, San Rafael, Seboyeta, Eastview, Manzano, Tajique, Torreon, Estancia.

Valencia County is bounded on the north by McKinley, Bernalillo, Sandoval, and Leonard Wood counties, on the east by Leonard Wood County, on the south by Lincoln and Socorro counties, and on the west by Arizona. It is the third largest of New Mexico counties, covering an area of 7,944 square miles, which is more than seven times the area of the State of Rhode Island; more than four times the area of the State of Delaware; almost twice the area of Connecticut; larger than Hawaii. Of this vast stretch 3,400,000 acres are still unappropriated and are being taken up at the rate of 10,000 acres a year by homesteaders. During the fiscal year ending June 30, 1903, there were entered 10,590.58 acres, of this 9,170 acres being taken up under the homestead act. Quite a large portion is included in private Spanish and Mexican grants, while about 401,000 acres are reserved. The county extends 236 miles from north to south.

Valencia County originally covered one-half the area of New Mexico; Socorro, Lincoln, Otero, Doña Ana east of the Rio Grande, Chaves, Eddy, part of Leonard Wood, and southwestern McKinley counties were at one time included in this county, the county seat of which was at Tome, then at Belen, and is at present at Los Lunas. It will also give a considerable part of its area to the formation of the county of Torrance on January 1, 1905.

The population, according to the census of 1900, was 13,895, an increase of over 50 per cent since 1870. The population is in greater part of Spanish and Mexican descent and the Spanish language is generally spoken, although the young generation has learned to speak English in the public schools and English is crowding Spanish as the language of the business and professional men. There are 1,500 Pueblo Indians there who are being gradually assimilated by the white native population. These Indians are at the pueblo of Acoma, 492

inhabitants, and the pueblo of Laguna, 1,077 population. The population of the county, by precincts, in 1900 was as follows:

Jarales	848	El Bosque	350
San Rafael	698	Cubero	342
Belen	673	San Mateo	322
Manzano	649	Tajique	318
Lower Tome	593	El Ceno	291
Cebolleta	565	Casa Colorado and Jaralosa (each)	219
Peralta	561	Cienega	182
Los Chaves	537	Juan Tafoya	175
Wingate	488	San Jose	172
Torreon	472	El Pino	171
Los Lunas	458	El Rito	111
Valencia	455	Punta de Agua	100
Upper Tome	392	Coolidge	60
Los Lentes	380		

The area and population of some of the northwestern precincts were reduced by the creation of McKinley County in 1901. On the other hand, several precincts, such as Belen, San Rafael, Torreon, Tajique, and Punta de Agua show considerable increase in population since 1900, due to immigration caused by railroad building. One-half of the population of the county lives in the Rio Grande Valley. The assessed valuation is $1,359,786, but this gives but a faint idea of its real wealth, for the census of 1900 estimates the agricultural wealth alone at $2,173,000. There are 500,000 sheep owned in the county, and many horses, cattle, and goats.

RIVERS.

As the Continental Divide passes through the county, the waters of Valencia County are drained into the Gulf of Mexico through the Rio Grande and into the Pacific through tributaries of the Colorado River. The principal stream is the Rio Grande, which passes through the county from north to south. There is a large area of irrigated land on both sides of the river along its entire course in the county. Between Los Lunas and Belen there are large alkali flats, once productive fields, which only need drainage to restore to them their former fertility. All along the river there is much waste bottom land, a portion of which above Los Lunas raises a scanty supply of coarse grass for grazing purposes. Below Los Lunas a large part of the land is covered with cottonwood thickets. Where these are cut away the land is found to be of excellent quality. No perennial streams enter the Rio Grande in Valencia County. The Puerco, however, which at times has a flood discharge of about 32,000 second-feet, flows in part through it, entering the Rio Grande in Socorro County. Along the Puerco and its tributaries something like 14,000 acres are under irrigation. The character of the country through which the Puerco passes is hilly and broken. Its altitude ranges from 4,000 to 7,000 feet, and the annual precipitation is very light, averaging only 7 inches. For that reason there are but few perennial streams in the whole drainage area. The major part of the precipitation occurs usually during the months of June, July, and August in the form of very heavy rains or cloud-bursts, resulting in torrents which for volume and duration are not exceeded in the Territory—a maximum discharge of 32,000 second-feet having been observed on the Puerco. Such floods, however, are unusual—this being the maximum—but

freshets discharging from 2,000 to 3,000 second-feet are comparatively frequent during the rainy season. Much the greater portion of the drainage area never furnishes water to the stream, the precipitation that reaches the arroyos being lost by seepage in the sandy beds. The Rio Puerco receives its entire perennial supply through a number of small streams from the western slope of the Nacimiento Mountains in Bernalillo and Rio Arriba counties, but a small amount, however, reaches the main stream which is dry south of Casa Salazar, Bernalillo County, from the time the spring flow ceases until the latter part of November, with the exception of times of freshets. These freshets have again and again washed away the bridge of the Santa Fe Pacific Railroad at Puerco, but lately the company has constructed a breakwater of two rows of heavy piles driven into solid ground, the space between being filled with large blocks of sandstone cemented in place.

From Casa Salazar to the mouth of the Puerco there are no irrigated lands except at San Ignacio, where 500 acres are in cultivation. In years past most of the rich bottom lands for 40 miles south of Casa Salazar were under irrigation, but within the last fifteen or twenty years the Puerco has been cutting out its bed until now it flows in a tortuous channel with precipitous banks from 30 to 40 feet below the level of the valley, rendering it impossible with the crude methods of the farmers to raise the water sufficiently to bring it upon the lands and causing the abandonment of that part of the valley. Modern irrigation methods, however, will ultimately bring this land under cultivation again. On the small tributaries, the La Jara, Los Pinos, Rito, La Leche, and Rito del Nacimiento, irrigation is confined to small patches along the sides of the narrow valleys aggregating about 700 acres. From the east boundary of the San Joaquin de Nacimiento grant to Casa Salazar, between which limits irrigation extends and which is entirely included in Bernalillo County, the irrigated areas are not continuous, but are located about the small settlements and aggregate 2,980 acres. It is the main tributary of the Rio Puerco, the San Jose, and its tributaries, the Cebolleta and Colorado, which are in greater part in Valencia County. This stream rises on the Continental Divide, and, flowing southeast, joins the Puerco about 4 miles east of San Jose. The normal flow is small and is wholly consumed by irrigation along the stream.

During the rainy season it discharges enormous quantities of water, and it is the conservation of these that would increase the area under irrigation manifold. On the upper portion of the stream, at the junction of the Cottonwood and Bluewater creeks, the Bluewater Land and Irrigation Company has constructed a dam 42 feet high, impounding water for the irrigation of its lands 12 miles below. From this reservoir 2,000 acres are irrigated. There are no other storage systems in the county. The principal irrigated acreage on the San Jose is between the Indian pueblos of Acoma and Laguna, about 3,900 acres being irrigated. About El Rito and Masita 800 acres are under irrigation, and these points mark the limit of irrigated acreage down the river. At Juan Tafoya about 200 acres are cultivated from springs in the canyon on the upper Salado, no further increase being practicable. In the vicinity of San Mateo about 600 acres are also served from springs, this acreage consuming the entire flow. In addition, 2,300 acres are in cultivation in detached areas throughout the county, this acreage consuming the entire independent water supply, with the

exception of the early spring and the flood flows of summer. Only by storage can this area be increased. There are a number of reservoir sites available.

Another source of supply of water for irrigation purposes is the underground flow, which is very strong in many parts of the county, especially so in the valley of the Rio Grande. Water can be developed at many places at a depth of only 25 feet, but thus far not much has been done in this line. The irrigation systems, except that in the vicinity of Bluewater, are antiquated and wasteful, and if modernized would supply a much larger area.

TOPOGRAPHY.

Naturally in so large an area as that covered by Valencia County almost every variety of topography is found. The Continental Divide crosses the county from north to south. East of the Rio Grande the Manzanos are the principal mountain range, forming a watershed between the Rio Grande drainage basin and the dry mesas of the eastern part of the county. East of the Manzanos are the Pedernal and the Animas hills. In the western part of the county the Zuni Mountains and the San Mateo Range are the principal mountain systems. A vast lava bed extends the entire breadth of the county east of the Continental Divide.

East of the Manzano Mountains lies a region of low plains, bounded on the west by the timbered foothills of the Manzanos and on the east by a low and barren ridge, terminating at the north in the hills of Pedernal and at the south in the Animas Hills. The abrupt exposure of the Jumanez mesa bounds this broad valley on the south, while on the north the plains continue almost unbroken to the San Pedro and Ortiz mountains and the rough country east of these groups. The southern portion of this valley is known as the Estancia Plains, and is remarkable for the salt and alkali basins which occupy the central portion. The low ledge referred to as marking the eastern limit of the southern portion of this valley is not a well-defined boundary line, but merely a gentle rise above the general level of the valley East of this the plains stretch unbroken by any prominent landmark. In two localities on these plains east of the dividing ridge are found basins more or less alkaline and saline; the first near the settlement of Pinos Wells, southeast of the Animas Hills some 12 or 15 miles; the second northeast of Pinos Wells about 15 miles. The geological conditions of this region are very simple. There is a constant dip to the east and south of east, quite marked along the western border of the valley, but becoming less noticeable farther east and away from the axis of the Carboniferous uplift, which produced the Sandia, Manzano, and more southern ranges, until it is almost, if not quite, imperceptible at the exposures about the most eastern of the saline basins. A few miles north of Berrendo Springs there are several imperfect exposures alternating lime and salt.

West of the Rio Grande the mesas are much broken by arroyos exposing the strata of rock.

MINERALS.

Valencia County is rich in minerals, but thus far comparatively little has been done to make this mineral wealth available. Gold,

silver, copper, iron, sulphur, lithographic stone, gypsum, brick clay, salt, pumice stone, ochre, building stone, cement, potash, and, most important of all, coal in vast, almost limitless, quantities are found in the county. Gold, silver, and copper ores exist in the Zuni Mountains, in Hell Canyon, where a mining camp has been established, and in the Manzanos. In the Zuni Mountains, especially in the Copper Hill district, considerable development work has been done. The Zuni Mountain Copper Company owns twelve claims near Copperton, 18 miles west of Grants, from which a fine wagon road to the camp has been built. A copper-smelting plant is to be erected. The company has a capital of $500,000. A railway spur is also to be built from Copperton to Bluewater by this company, in which leading Santa Fe Railway officials are interested. The ore exists in immense bodies and assays from 13 to 23 per cent copper. A number of territorial officials have also located ten claims in that district, upon one of which 200 feet of development work has been done with good results. The Pueblo Indians have from time immemorial secured gold for their ornaments from the Zuni Mountains, but no active gold mining is being done in that section at present.

In the Manzano Mountains rich copper prospects have been located, some of the copper found being almost pure. There are also indications of gold and silver and iron in large quantities.

The Carricito Development Company is developing a promising gold and copper property in the Manzano Mountains.

The Belen Carricito Development Company has an extensive property near Abo pass and intends to commence developing its claims in the near future. The outlook for a prosperous mining camp in that section is very promising.

Ochre is found in the foothills of the Gallinas, which extend into eastern Valencia County. The layers of this mineral are found about 75 feet below the surface, and the deposits cover a large area. The rock will not spawl, but the action of a boring drill grinds it into a fine, gritless powder of the color of red lead of a dark and dull hue.

More salt is exported from Valencia County than from any other county in the Territory. It abounds in the western as well as in the eastern parts, and is hauled to market by wagons.

The principal salt lake near Estancia is round and a quarter of a mile in diameter. The water, which attains a depth of some 3 feet or more in places, is a supersaturated solution of sodium chloride. On the surface of the lake float thin particles of salt, and from the top of the basin the bottom looks as if covered with snow. At the bottom of the lake is a thick deposit of pure crystalline salt, the cubical crystals being very large and perfect. The salt is secured by driving wells in the lake and loading wagons from the rich deposits at the bottom of the lake and also by gathering the thick saline scum on the water. The lake is situated in a high ridge running due north and south. On the north of this ridge is an open plain in which there are many depressions or pits in which water gathers. Most of these produce alkali, but two of them produce salt. On the west of the ridge is Dog Lake and several other lakes and depressions. In this ridge there are also extensive deposits of sulphur. Digging or boring will probably develop inexhaustible quantities both of salt and of sulphur.

The erosions that have cut Valencia County in so many places have

also exposed layers of coal of inexhaustible quantity and good quality. Along the Puerco and west of the Divide, seams of lignite coal crop out of the arroyo or canyon walls in scores of places. A peculiar feature of some of these seams is that a layer of black shale, if traced for a short distance, passes into a seam of clear coal and vice versa. About 10,000 acres of these coal lands have been located by the Southern Pacific Railroad Company. In the Manzano Mountains good coal is also found. Undoubtedly the completion of the railroads now in progress of construction will lead to the development of many of these coal deposits.

Potash is found at Casa Colorado.

Magnetic iron ore is found on the Antonio Sedillo grant.

Taken all in all, Valencia County presents one of the richest fields for the prospector and the investor in mining propositions to be found in the Southwest.

Valencia County has a greater railroad mileage than any other county in the Territory. The Santa Fe Railway cuts through the eastern portion from north to south, entering the county south of Isleta and leaving it north of Sabinal, a distance of 25 miles, the principal towns on the line being Los Lunas, elevation 4,832 feet; and Belen, elevation 4,785 feet. Other towns on or near this railroad are Peralta, Valencia, Tome, and Jarales. The Santa Fe Pacific Railway enters the county at Rio Puerco and leaves it northwest of Bluewater, the distance being 80 miles. The principal towns on this line are Laguna, Grant, and Bluewater; while other stations are Garcia, Shawnee, Armijo, El Rito, Cubero, McCartys, Horace, Toltec, and Baca. The Santa Fe Central Railway crosses the eastern part of the county for 45 miles, the stations on the line being McIntosh; Estancia, elevation 6,140 feet; Willard, 6,140 feet; Progreso, 6,210 feet; and Bianca, 6,285 feet. A spur will be constructed to the salt lakes.

The El Paso and Rock Island Railway also crosses the eastern part of the county, but east of the Santa Fe Central, entering the county near the junction with the Santa Fe Central at Torrance, in Lincoln County, and leaving the county near Pintada, in Leonard Wood County, a distance of 30 miles, the stations in the county being Trinchera, Marino, and Llano. The El Paso and Rock Island and the Santa Fe Central railways are doing much for the development of the eastern part.

The Colorado and Gulf Railroad has been surveyed through the western part and will have about 40 miles of track.

The cut-off which the Atchison, Topeka and Santa Fe Railway is building from Puerco, in Valencia County, to a connection with the Rock Island system at Llano traverses the county from east to west for 160 miles, crossing the Rock Island near Llano, the Santa Fe Central at Willard, and the Santa Fe line from Albuquerque to El Paso at Belen, forming a junction with the Santa Fe Pacific at Rio Puerco. When these lines are completed, and they will be in 1904, the county will have about 400 miles of railroad.

Valencia County has about 300 miles of telegraph, and a telephone line extends from Albuquerque to Belen and Los Lunas.

AGRICULTURE.

Agriculture is one of the chief industries. The lands under irrigation are very fertile and the climate is perfection itself for the raising

of grain, vegetables, and fruit. Irrigation permits the husbandman to water his land when it is needed and to withhold moisture when it is not necessary. This prevents crop failures and permits plant life to attain that perfection which it never reaches in the more humid zones. Wheat grown in the vicinity of Belen captured the first premium at the World's Fair at Chicago, and again a gold medal at the Charleston Exposition, the wheat weighing 60½ pounds per bushel. Oats grown on a farm 6 miles from Los Lunas took the second prize at the Columbian Exposition. The principal crops are wheat, barley, oats, corn, alfalfa, and all vegetables and fruits of the south temperate zone. Some of the finest vineyards in the Southwest are found in the county. Grapes are grown in large quantities, the mission grape predominating, but other varieties, such as the Tokay, Sultana, Concord, Muscat, and others doing exceedingly well. Alfalfa is a staple crop. In the Zuni Mountains and several other hill districts crops are grown without irrigation, as the rainfall is sufficient to mature them. The county offers many opportunities to the farmer and the fruit raiser. Land under cultivation can be bought very cheaply, while vast tracts of Government land are available to the homesteader and need but the touch of water to make them great producers of grain, vegetables, and fruit. The average yield is 30 bushels of wheat, 40 to 50 bushels of barley, 60 bushels of oats, 35 bushels of corn, and 5 tons of hay to the acre.

STOCK.

Valencia County includes the best stock-raising section in the southwest. The mild winters, cool summers, good water, nutritious grasses, and sheltered valleys, and canyons have attracted the cattle and sheep grower. The county is one of the leading sheep-raising sections in New Mexico, there being 400,000 or more sheep on its ranges and thousands of cattle and horses. Lately some attention has been paid to the raising of goats, and the success is such that the number of these animals will be very much on the increase during the next few years.

MANUFACTURING INDUSTRIES.

An excellent quality of wine and brandy is manufactured at Belen. At this place is also one of the largest flouring mills in the Territory. At Laguna and Peralta are fine modern flour mills. The existence of large quantities of coal, of raw material in the shape of wool, hides, minerals, and agricultural products, the possession of much railroad mileage, destine Valencia to be an industrial section of no mean proportions.

TIMBER.

The county has some of the finest timber lands in the Territory, which of late have attracted the attention of lumbermen and capitalists. The so-called Mitchell tract in the southwestern part covers 300,000 acres, on which it is estimated there are 2,000,000,000 feet of good white pine lumber. The American Lumber Company, a syndicate capitalized at $8,000,000, will cut this timber and will erect extensive sawmills, as well as sash, door, and box factories. A logging road is being built from Thoreau on the Santa Fe-Pacific to the tract. The company

has also secured options on the timber lands belonging to the Santa Fe-Pacific Railway in the same part of the county. It is not the intention to denude this region of its timber entirely, but to cut merely the mature timber and permit the young timber to grow up in place of that cut down. In the Zuni Mountains, as well as in the San Mateo and Manzano Mountains, there are splendid tracts of timber, those in the latter mountains being exploited extensively for railroad ties and telegraph poles since work has been commenced on the Santa Fe Central Railway, which passes near this timber district.

CLIMATE.

The climate is as nearly perfect as can be found anywhere. The varying degrees of altitude give sufficient variety to make it beneficial to every and any case of lung and throat trouble. The winters are much milder than in the northern parts of the Territory, and summer nights are always cool, while the year round the air is dry, light, and invigorating. Outdoor life in a climate like this is a certain cure for incipient consumption and throat trouble, and is also a panacea for many other ills.

EDUCATION.

Of late years great progress has been made in public education. Every district has a public school and the school term ranges from three to ten months, in accordance with the resources of the school district. There are several good sectarian schools at the principal settlements, while the nearness of the University of New Mexico at Albuquerque and the Territorial School of Mines at Socorro are a great advantage to the young people of the county.

ATTRACTIONS FOR TOURISTS.

There is good hunting and fishing in various parts. The broken nature of the country affords many picturesque natural sights. The primitive ways of living in most of these settlements, as well as the Indian pueblos of Laguna and Acoma, attract many tourists. Laguna is one of the largest and most populous Indian pueblos in the Territory. Acoma, the Sky City, and the Enchanted Mesa are world famous. The classic tale of Charles F. Lummis of the Enchanted Mesa has traveled far and wide, and for years the former picturesque home of the Acoma pueblos, perched like an eaglet's nest on the summit of an almost inaccessible cliff, has been the mecca of numerous pilgrims. The Enchanted Mesa rises sheer 700 feet above the surface of the surrounding plain, about a mile distant from the present pueblo. A single narrow trail leads from the civilized fields below to the top of the mesa. But one day, centuries ago, the narrow trail was destroyed and then the village was built in the valley below. The Indians are making considerable advance in civilization, and many of them find remunerative employment annually in the sugar-beet fields of Colorado. They make excellent pottery, for which there is a great demand among tourists.

In Abo Pass, as well as in the western part of the county, are found interesting pueblo and prehistoric ruins which have attracted and puzzled scientists and greatly interested tourists who like to visit out-of-the-way places not touched by advancing civilization.

El Moro, or Inscription Rock, as it is locally and generally known, is situated in Valencia County, just east of the McKinley County boundary, and 35 miles east of the famous Zuni pueblo, and 50 miles south of the Santa Fe-Pacific Railroad.

This picturesque and interesting historical cliff is located at the extreme southern end of the lava-strewn desert valley, the drainage of which forms a tributary of the Zuni River Basin. The valley meanders through mountains and high mesa lands in a southerly and easterly direction from the ancient and famed pueblo of Zuni, once the flower of the Seven Cities of Cibola. On the southeast it is fringed with the dark line of the forest-covered Zuni Mountain range; on the southwest it is marked by a series of vari-colored sandstone cliffs, carved into fantastic shapes by the action of the elements. As progress is made southward these cliffs become bold and towering and form a veritable gallery of colossal natural monuments, which the tourist need not be told is El Moro, or Inscription Rock.

This majestic cliff of fine-grained sandstone projects several hundred yards east into the valley from the mesa line and dwarfs into insignificance every surrounding object.

Not a Gibraltar, and lacking the awful magnitude of El Capitan of the Yosemite, yet a more beautiful and imposing bit of scenery is not to be found in the United States. The rock covers about 10 or 12 acres, and its sheer, smooth walls rise perpendicularly to a dizzy height of several hundred feet. The base is triangular, narrowing to a rounded but comparatively thin edge at the eastern end. The stratification is slightly tilted, and the stone has a decided transverse cleavage. The action of frost has broken immense sheets of stone from the cliff, leaving smooth patches of wall. The top stratum is much harder than that of the bottom, and has served as a shield to the softer material below, thus preserving the bold outlines of the rock.

It is not too much to say that no rock formation in the west, or, perhaps, in the world, is so well adapted to the purpose for which this table of stone was used. At least history does not record any collection of similar data. Here are records covering two centuries, some of which are the only extant memoranda of the early expeditions and explorations of what is now the southwestern part of the United States.

The coloring of this venerable pile is characteristic of the American desert. Here there are no frowning cliffs, no dark and blackened walls, no moss-covered crags, and no somber dikes, but, like a beautiful flag for the first time unfurled, this glorious rock, resplendent in bright but softly blended hues, stands out in bold relief as if newly cleaved from the virgin formation. The prevailing color is a brownish gray, relieved by waved lines tinted by shades of red, yellow, drab, and bold dashes of kindred color.

On these smooth walls, usually under some projecting stratum, inscriptions were cut by the early conquerors and explorers, which have made this rock one among the most interesting objects on the continent.

Here in this remote and uninhabited region, in the shadow of one of nature's most unique obelisks, wrapped in the profound silence of the desert, with no living thing to break the silence, it is hard to realize that three hundred years ago these same walls echoed the clank of steel harness and coats of mail; that with the implements of Spanish

conquest the pathfinders in the New World were carving historical records upon the eternal rocks.

Just what instruments were used it is difficult to say, but the oldest inscriptions, covering a period of over half a century, were cut with a round-pointed instrument, possibly the point of a sword or Spanish verduguillo.

It is rather remarkable that these Spanish inscriptions, cut two hundred or three hundred years ago, should have outlived those of Americans made less than half a century ago. This is due to the fact that those cut by the Spanish adventurers were executed by a small pointed instrument, cutting a deep, thread-like groove or line, while the work of the Americans was done with the slash of the ever-ready jackknife, the defacer of almost every natural object in America not under the immediate surveillance of the police. The Spanish writer executed his lettering in script as neatly as if inscribing the record page of the Magna Charta. This is in marked contrast with the inscriptions of John Smith and others, which have the usual display of bad taste characteristic in defacing public property. A broad, open line cut in this sandstone is subject to obliteration by the action of sand laden wind, while a fine, narrow mark is little affected.

On the south side of the rock, in the angle formed by the mesa and the projection of El Moro, there is a small spring under the overhanging brow of the cliff. This, doubtless, was the favorite camping ground of the ancient explorer and traveler passing through this arid region from the Rio Grande to Zuñi, or, as it was then known, the Seven Cities of Cibola. The old, well-worn road, now disused, passes around and under the very wall of El Moro, and this spring was the only one on this road within 30 miles or more in either direction.

Locally, Inscription Rock and El Moro are known as separate and distinct monumental rocks. The latter translated, The Castle, is the rock standing out in bold relief to the east, while Inscription Rock is the name applied to the formation to the west, which is a part of the mesa. On the south side, in the angle formed by the two, one extending east and the other south, is a great chamber or cavern, a natural amphitheater, where secure refuge from storm or human foe could easily be secured. It is here too, that the only spring within many miles wells up, as if to make the natural fortification doubly secure. Upon these walls are many of the best preserved Spanish inscriptions, although there are quite a number 200 feet east, under the shadows of a stately pine tree, and on the north side of El Moro. Most of them are as plain and apparently as legible as the day they were written; especially is this true of the older ones, carved during the sixteenth and seventeenth centuries.

The following are four of the many legible inscriptions on the rock:

The year 1716, on the 26th day of August, Don Feliz Martinez, governor and captain-general of this kingdom, passed by here to the reduction and conquest of Moqui, and in his company was the Reverend Father Fray Antonio Carmago, custodian and judge ecclesiastical.

Ensign Don Joseph de Payba Basconzelos passed by here the year that he brought the town council of the kingdom, at his own expense, February 18, 1726.

The most illustrious sir captain-general of the provinces of New Mexico, for the King our Master, passed by here on his return from the pueblo of Zuñi on the 29th day of July, in the year 1629, and the natives he put at peace, and, at their request, asked his favor as vassals of His Majesty, they renewed obedience, which was accom-

plished by his persuasive zeal and prudence as a Christian soldier, gallant and tireless in the remembrance of his King.

Here passed the governor, Don Francisco Manuel de Silva Nieto, that great things have already been accomplished by his indomitable will and valor, with wagons of the King our Master; a thing which he put in this form on August 9, 1629, and to Zuñi I pass and the faith I carry.

SETTLEMENTS.

Belen, Los Lunas, San Rafael, and Peralta are described under the head of "Cities and towns of New Mexico."

Tome is situated in the Rio Grande Valley, and was at one time the county seat. Population 800.

Other towns in the Rio Grande Valley are Valencia, population 500, and Jarales, population 800. East of the Rio Grande are the following settlements: Pinos Wells, near the Salt Lakes, and a center of trade, population 100; Punta de Agua, which has several good farms and ranches, population 150; Tajique, Torreon, Manzano, Estancia, Progreso, and Eastview are at the foot of the Manzano Mountains and have stores and post-offices. West of the Rio Grande are the following post-offices and settlements besides San Rafael, Laguna, and Acoma, previously mentioned: Seboyeta, San Mateo, Amado, Bluewater, Grant, and Cubero, all centers of agricultural districts and stock ranges, and Copperton, a mining camp.

The San Mateo country is a famous sheep section, and the fertile land around about is irrigated from permanent and large running streams which come down the slopes of the San Mateo Mountains.

The eastern portion of Valencia County will, after January 1, 1905, go toward the creation of the new county of Torrance, whose county seat will be at Progreso.

THE FUTURE OF VALENCIA COUNTY.

The county is a vast, undeveloped empire, incomparably rich in nature's products. It has in itself the making of a State, and when its resources have been fully developed will be able to support a quarter of a million or more of people. It is a country for the immigrant, the farmer, the stock grower, the prospector, the promoter, the capitalist, and investor.

FINANCIAL STATEMENT OF VALENCIA COUNTY.

Total indebtedness of said county up to and including June 30, 1902, amounts to $106,982, composed of the following amounts:

Bonded debt.

Date of issue.	Date of maturity.	For what purpose issued.	Rate of interest.	Amount.
	Years.		*Per cent.*	
Jan. 1, 1882	10-20	Floating debt	8	$18,982.00
Jan. 1, 1885	10-00	.....do	6	3,800.00
Jan. 1, 1889	10-20	.....do	6	18,700.00
Aug. 1, 1889	10-20	Current expenses	6	30,000.00
Jan. 1, 1891	10-20	.....do	6	7,000.00
Jan. 1, 1895	10-20	Floating debt	6	20,000.00
Jan. 1, 1897	10-20	.....do	6	8,500.00
Total bonded indebtedness				106,982.00
Total assessed value of real and personal property for the year 1902				1,359,786.00

MAIN STREET, ROSWELL.

GOLD AVENUE, ALBUQUERQUE.

RAILROAD AVENUE, ALBUQUERQUE.

CITIES AND TOWNS OF NEW MEXICO.

New Mexico has no large cities in the accepted sense of the word, yet it boasts of a number of progressive, growing towns that are up to date in modern conveniences, municipal progress, and attractiveness as residence centers. As a matter of fact, New Mexico is a commonwealth of villages rather than of scattered population. The tendency from the earliest times has been to build in communities rather than to live isolated from neighbors.

Fully one-third of the population of the Territory lives in the forty largest settlements, while another third lives in the smaller towns and villages.

Herewith follows a description of the principal towns, some of them older than any other communities in the United States and others founded only a few years, yea, a few months ago.

ALBUQUERQUE.

The city of Albuquerque, the county seat of Bernalillo County, is the largest city in New Mexico. It is located in the Rio Grande Valley and on the Santa Fe Railway. Its merchants cover a trade territory of about 100,000 square miles, or a district larger than the six New England States and the State of New York combined, which gives the place a wholesale trade much larger than is done by many eastern cities of three times its population. The population of the place, according to the census, is 6,328. Old Albuquerque, which is practically a portion of the city proper, has 1,191 people, and more distant suburban precincts have 4,613 inhabitants, giving the city and suburbs a population of 12,042 at the time of the census of 1900, and a very conservative estimate places the increase since that time at 3,000, making the present total a little more than 15,000.

Many eastern people imagine that in coming "away out to New Mexico" they will put themselves entirely beyond the pale of civilization, and for the benefit of such it may be said that they will find Albuquerque fully abreast any eastern city of double its size in everything that goes to make up the modern, progressive, American town. There are few more cosmopolitan cities in the United States than Albuquerque, and the peculiar American quality of "get there" is very distinctly in evidence on every hand. The United States Post-Office Department has made it the postal headquarters for the Southwest, and the post-office there is the depository for all the fourth-class offices in both New Mexico and Arizona. The free-delivery system was inaugurated about ten years ago, and mail is delivered twice a day in all parts of the city and once a day in the suburbs. The town has a fine system of public schools, with a large and modern schoolhouse in each ward and a magnificent high-school building centrally located. There are, in addition, a number of good private schools, while denomi-

national institutions are maintained by the Methodists, Presbyterians, and Catholics.

It is also the seat of the University of New Mexico, established and maintained by the Territory and endowed by the United States with a liberal donation of public land. The university building is located upon an eminence about 200 feet above the general level of the town, with an unobstructed view for many miles in every direction. With the Sandia Mountains 12 miles east for a back ground, the view takes in the Jemez Mountains, 60 miles north, the San Mateos, 70 miles west, and the Socorro and Magdalenas, 75 miles south, while with a glass may be seen the Mogollons, more than 125 miles to the southwest. The institution has a first-class faculty and ranks among the best Western colleges. "Hadley Hall," a handsome $20,000 structure recently completed, gives the university a department devoted exclusively to the study of climatology, with special reference to the effect of climate on the cure and prevention of tuberculosis and kindred diseases, the only institution of the kind in the United States.

There is also located here a large Government Indian industrial school with more than 300 pupils. In the matter of religious advantages, the town is very thoroughly equipped. All the leading Christian denominations have societies there, with good commodious houses of worship in which services are held regularly, and a Jewish society, organized some years ago, has built a synagogue. There are commodious places of public entertainment and amusement, in which are given lectures, operas, theatrical entertainments, etc., and during the entertainment season the people of the place are never at a loss for "some place to go." The Elks have under construction one of the finest opera houses between Kansas City and Los Angeles. One of the institutions of Albuquerque worthy of special notice is the "Commercial Club." This represents a successful combination of business and social interests, and possesses within the one organization all the principal features of a chamber of commerce and a social club. To the active and effective work of this organization as a general "push committee" is attributed much of the prosperity which has been enjoyed by the town during the last ten years. It is quartered in its own building, erected especially for the purpose at a cost of $75,000, a large and elegant structure of red sandstone, and which is pronounced by visitors as fine a club house as any west of Chicago.

The principal shops of the Atchison, Topeka and Santa Fe Railway west of Topeka are located at Albuquerque and furnish regular employment to over 700 men. These shops are being steadily enlarged, and it is said to be the intention of the company to have all its work done there for all of that portion of its system west of the western line of Kansas, which will render necessary the employment at Albuquerque of about 1,200 men.

There is an excellent system of waterworks, furnishing the purest of water in great abundance both for domestic use and for lawn irrigation, and at very low rates. Light is furnished by gas works and an electric-light plant, the streets being lighted by electricity.

Water for irrigation purposes in inexhaustible quantities can be secured from driven wells from 6 to 12 feet deep anywhere in the valley of the Rio Grande, but for city purposes it is procured from bored wells from 100 to 600 feet, assuring its purity and excellence for domestic use.

All of the streets are graded and most of them paved with natural cement obtained from the neighboring hills, and laid upon a foundation of cobblestones and gravel, making a thoroughfare very firm, smooth, and durable. Excellent sidewalks line all the principal streets of the place, the popular material for this purpose being an artificial stone made of sand and Portland cement upon a foundation of gravel. This makes a walk as hard and smooth as natural stone and apparently quite as durable.

One of the largest and finest sanitariums in the West was completed and opened to the public in the early part of the present year, and is conducted by the Sisters of Charity. The Santa Fe Railway Company has recently completed at this point the finest and most commodious station building and hotel on the line of its road between Chicago and San Francisco.

The manufacturing interests of the town, in addition to the railway works above named, are represented by a foundry and machine shop which turns out large quantities of work, especially for the many mining camps in various parts of the Territory; a brewery and two ice factories, which ship their products to all parts of Mexico and west to California; two flouring mills, two mineral water establishments, a planing mill, four brick yards, two cigar factories, a broom factory, a wool-scouring plant, two steam laundries, and many smaller establishments. Of the 20,000,000 pounds of wool produced annually in New Mexico, Albuquerque merchants handle fully one-fifth, a large portion of which is now manufactured at home by a woolen mill of large capacity opened during the present year and now in successful operation. This enterprise is very comprehensive in its scope and includes all the processes of pulling, scouring, dyeing, tanning, and manufacturing wool and leather. It is wholly a New Mexico enterprise and the labor employed is largely native. The motto of the concern is "From sheep's back to your back," and tersely expresses the wide range and diversity of its processes and products.

The American Lumber Company is erecting a mill just northwest of the city. One building 200 feet long by 75 feet wide and two stories high is completed, and other buildings are in course of construction. This mill when completed will have a capacity of 100,000 feet of lumber per day.

There is an excellent opening there for a canning factory, to use the fruits and vegetables which are grown in great abundance in that vicinity, and a beet-sugar factory, not to speak of a tannery, shoe factory, furniture factory, and other establishments for which the raw material, as well as the fuel, power, and the market for finished material, are close at hand.

The census of 1900 credits Bernalillo with $864,604 capital invested in manufactures, $793,644 of that being invested in Albuquerque. This gives employment to 1,140 men and the value of their products is $2,007,772.

Nearly all lines of business, commercial, mechanical, and professional, are represented in Albuquerque, and it has in addition a considerable population composed of persons not engaged in any active business, who seek the mild, dry atmosphere of this section, especially during the winter season, for health or pleasure. The town has several prosperous banking institutions.

There are two daily papers in the town; one, the Albuquerque

Journal-Democrat, issued every morning, including Sunday, and the other, the Albuquerque Daily Citizen, issued every evening except Sunday; four weekly papers, one English, three Spanish, and several monthly publications. The town also possesses the largest and best free public library in the Southwest, which is maintained by a special tax levied by the city council for that purpose, and for which a fine building was recently donated by a public-spirited citizen of the Territory.

Albuquerque has good railway facilities. The Atchison, Topeka and Santa Fe gives it access to all points north and south, while the Santa Fe Pacific, starting at Albuquerque, gives the town direct connection with all the country between the Rio Grande and the Pacific coast. That portion of New Mexico directly east of Albuquerque has never been in close touch with the city by rail, but the want of first-class facilities in that direction will be supplied by the Santa Fe Central and Albuquerque Eastern. The former road is already completed and trains are now running over it, while the latter is in course of construction, and the company is under contract to have it completed to Albuquerque by the 1st of January, 1904. This will give the merchants of the city access to the trade of all sections of the Territory except the northwest, and that gap will be closed by the building of the Albuquerque and Durango road, a line that is projected by the Santa Fe Central Company, and is already surveyed.

The climate of Albuquerque, while it possesses the general characteristics of that of New Mexico in general, is milder in winter than that of the more northern towns, and owing to its lower altitude the city is a sanitarium for those health seekers who can not bear the more severe winters and the greater altitude of the northern counties. During the summer months the near-by city of Santa Fe and the many convenient mountain resorts offer a refuge from the heat, which, however, is at no time so oppressive as in the more humid east. It is only during the afternoon hours in July and August that the maximum temperature at times reaches 100°, while the minimum during the night is very seldom above 65°, which seems 10° to 20° lower than it would in a more humid climate.

LAS VEGAS.

By J. K. GOODALL.

(In preparing the following article, literature already extant upon the subject has been largely consulted and in many instances has been copied verbatim, so that the article does not pretend to be original in its entirety.)

Las Vegas means "The Meadows." It is a city of over 10,000 inhabitants, situated on both sides of the Gallinas River, and is the county seat of San Miguel County. It lies in a beautiful and fertile valley at the western edge of a wide plateau or table-land, stretching many miles eastward and at the foot of the main range of the Rocky Mountains, occupying an ideal and commanding site in a commercial as well as climatic respect.

The history of Las Vegas commences definitely with the year 1835, when a colony was established there by the Government of Mexico. A grant of land comprising nearly 500,000 acres in extent was given to the community of Las Vegas for homestead and agricultural pur-

COMMERCIAL CLUB BUILDING AT ALBUQUERQUE.

MASONIC BUILDING AND OPERA HOUSE AT EAST LAS VEGAS.

poses, and through colonization the population gradually increased and the town or community of Las Vegas was permanently established.

Las Vegas of to-day, which is a modern city, is composed, strictly speaking, of the incorporated city of Las Vegas and the old town, now incorporated, lying west of the river. While portions of the old town have a quaint and picturesque appearance, adobe houses, narrow, crooked streets, old customs, handicrafts, and occupations, always of interest both to local residents and tourists, yet it, as well as the new town east of the river, constitute distinctive modern cities. The streets are wide and well graded, while cement sidewalks line almost every street, and many of the streets are shaded with growing trees. Three parks, with lawns and trees, add to the beauty and salubrity of the place. Handsome and well filled stores, elegant residences with attractive environments and innumerable beautiful lawns set in grass and adorned with shrubbery and flowers, combine to proclaim a cultured community possessed of all modern comforts and conveniences, and socially comparing favorably with any other city of its size.

Las Vegas is the natural sanitarium of the United States, combining more natural advantages than any other place in America. Its thermal waters are the equal of the Hot Springs of Arkansas, while its climate is infinitely superior. There is no malaria, no excessive heat nor cold, and there is freedom from mosquitoes. The air is pure, dry, rarified, and highly electrified, a certain cure for consumption, if the cure be taken in time. The hot waters at the hot springs near by are a specific for liver, skin, rheumatic, and blood disorders. For the year 1902 the mean annual temperature was 51.7°. There were two hundred and eighty-six clear days, sixty-four partly clouded days, and only fifteen cloudy days. On fifty-three days more than 0.01 of an inch of precipitation occurred with a total rainfall of 9.78 inches and 15.5 inches of snowfall, the normal annual precipitation being 19.35 inches.

The water supply is ideal, being taken from the Gallinas River, in the canyon, about 7 miles above Las Vegas. The water is absolutely pure and is clear as crystal, being spring water or melted snow. The latitude of Las Vegas is about the same as that of central Tennessee, while the altitude is nearly 6,500 feet. This combination gives a peculiar and happy result. In the winter the thermometer seldom falls below 40° in the sun, while it often runs up to 65° or even more. On the other hand, in the summer, the heat is never oppressive in the shade and no night is too warm for comfortable sleep under one or two blankets. The sun will shine nine days out of every ten the year around. This, with the extreme dryness of the air, caused by the slight precipitation of moisture, the resinous aroma coming down from the pine-clad mountains, the large amount of electricity in the air, and the ozone resulting from the altitude, as well as the location of the town, land-locked by mountain and mesa, combine to produce an atmosphere which is a balm to the respiratory organs affected by disease. The percentage of deaths from consumption is lower in New Mexico than it is anywhere else in the United States; and no place outside of New Mexico excels Las Vegas in the salubrity of its climate. Asthmatics experience immediate and permanent relief in this altitude.

In the way of health and pleasure resorts Las Vegas is unrivaled. In a radius of 20 miles, in romantic mountain glens, are located many picturesque health resorts, and at Las Vegas Hot Springs, connected

with Las Vegas by an electric railway, is the famous Montezuma Hotel, the finest hostelry between Chicago and California. The hotel is situated in a beautiful canyon about 5 miles from the city, where the hot springs, 40 in number, come boiling to the surface. Among the other resorts are included Harvey's resort, the highest mountain resort in the world; El Porvenir, Sandoval's, Mineral Hill, Romero ranch, Blakes, Sparks, Sapello, Rociada, and other places, where health can be recovered and life becomes a pleasure to the invalid and the overworked business man alike; where one can enjoy all mountain sports, such as mountain-trout fishing, hunting, etc. The lover of nature has there the opportunity of viewing some of the grandest mountain scenery in all the Rocky Mountain regions, a wagon road being under construction at present across the famous Pecos Forest Reserve to Santa Fe.

Las Vegas affords very excellent educational advantages, having five public schools, one being a beautiful stone structure, costing $25,000, and the Territorial normal school, which has quite an advanced course of study. These schools employ upward of 21 teachers, with an enrollment of 2,200 children and students. Among other schools are the School of the Immaculate Conception, conducted by the Sisters of Loretto; Presbyterian Mission; Methodist Manual Training School; Christian Brothers, and others; also a kindergarten and commercial school in connection with the normal university, as well as several music schools and private teachers. There is now being constructed a Carnegie public library to cost not less than $10,000.

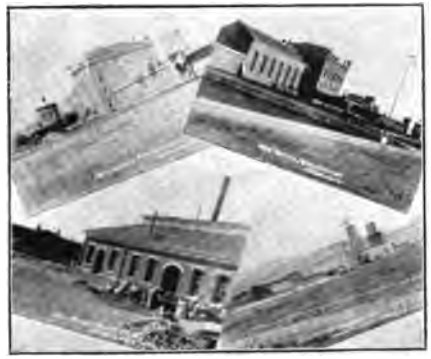
Las Vegas is the headquarters of the New Mexico division of the Santa Fe Railway system, and has railroad machine shops, tie-preserving works, stock yards, etc. It has two national and one savings bank and one trust and savings company with deposits of nearly a million, three local building and loan associations, over a dozen new and commodious hotels, restaurants, and boarding houses; commission and wholesale firms carrying large stocks of merchandise, doing an annual business of millions of dollars and supplying country stores and ranches all over the Territory. The many flourishing retail stores attest to the large and lucrative business done, and in an immense department store every material want can be supplied. The wholesale and commission houses of Las Vegas carry enormous stocks of goods and their business extends far beyond the limits of the Territory. Las Vegas is a noted wool center, and the annual sales of that article in Las Vegas reach into the millions, 5,000,000 pounds having been disposed of in the year 1901. Here is located the largest sheep-dipping plant in the world, and five wool-scouring mills are operated to scour the wool product. Las Vegas has earned and holds the reputation of being the greatest wool center in the Southwest.

There are published in Las Vegas the Optic, an eight-page daily newspaper, having the Associated Press service; several weekly publications, including the weekly Optic and Stock Grower, La Voz del Pueblo, El Independiente, La Revista Catolica, and other publications.

There are over 12 churches of all denominations, 23 civic societies and fraternal orders, and many public buildings, including a city hall, normal school, public schools, and Territorial insane asylum. Las Vegas has also about 8 miles of electric railway, with an additional 2 miles or more to be constructed soon; 2 electric lighting plants; a roller flour mill, with a capacity of 50 barrels per day, as well as

FALLS BELOW THE RESERVOIR AT SANTA FE.

RESERVOIR AT SANTA FE.



TERRITORIAL PENITENTIARY.

ordinary flour mills; a well-equipped brewery, and bottling establishments; a manufactory of mineral and carbonated waters; 3 or more carriage and wagon manufactories; saddle and harness factories; 2 planing mills, as well as 2 lumber yards; 1 foundry, and machine shops; 2 ice plants, with a business that extends from Kansas to Arizona; a cold-storage plant; 3 livery stables; a copper smelting works, as well as enterprises of less importance.

The retail merchants of Las Vegas are many in number and carry large stocks of goods. Las Vegas has two telephone exchanges, with one that will soon connect with Denver and other Colorado points. The Western Union and the Postal Telegraph companies also have offices in the town. A large and well-equipped sanitarium, known as St. Anthony's Sanitarium, is conducted in the city by the Sisters of Charity.

Las Vegas and vicinity are enormously rich in natural resources. There are undeveloped mines of copper and precious metals; there are quarries of building stone that can not be surpassed anywhere, while the city is surrounded with thousands of acres of rich grazing and agricultural lands on which can be grown alfalfa hay, corn, wheat, and other grains and agricultural produce, while the acreage in apples, peaches, and other fruit trees is being increased each year.

In fact, Las Vegas, by reason of its natural endowments of mineral and agricultural resources and its superb climate, has advantages possessed by but few other cities, and it can be recommended to the world as an ideal place in which to live and enjoy life.

SANTA FE.

The historic city of Santa Fe, seat of the government of the Territory of New Mexico, as well as the county seat of Santa Fe County, and the see of an archbishop of the Roman Catholic Church, enjoys the distinction of being one of the oldest towns and the oldest capital in the United States. Its permanent settlement by Europeans antedates the founding of Jamestown and also the landing of the Pilgrim Fathers at Plymouth more than twenty years. The thrilling and romantic incidents composing its history; the protracted and bloody struggles with hordes of savage Indians; the capture and pillage by hostile Pueblos in 1680; the general massacre of missionaries and explorers and flight of the governor and a few followers in the night to El Paso; the reserving of some of the handsomest Spanish maidens for wives of favored warriors; the desecration and destruction of the Christian churches and the restoration of the worship of snakes and stone idols; the reconquest by Diego de Vargas twelve years later; the terrible punishment visited upon the rebellious Pueblos; the change from Spanish rule to the rule of the triumphant Republic of Mexico; the capture by the United States forces under General Kearny and the building of old Fort Marcy; the stirring scenes accompanying the distribution of the immense traffic of the Santa Fe trail; the wild deeds of desperadoes, and the fabulous hazards at cards in the days before the advent of the railroad, afford the material for an epic poem of deep interest.

Here, so carefully preserved that the marks of its three hundred and five years of age are not perceptible, is located the noted "Adobe Palace," which was the official residence of the Spanish and Mexican

governors, and since the Mexican war has been the headquarters of all the Territorial governors or secretaries appointed by the different Presidents of the United States. Here is situated the oldest house standing on American soil, and near by is the San Miguel Church, first built in 1540 and still used as a place of worship. Here stand the beautiful and imposing new capitol building, the massive modern cathedral of St. Francis, the large and enduring stone Federal building, the modern penitentiary of New Mexico, San Miguel College, the Garita, the oldest cemetery in the Southwest, old Fort Marcy, Guadalupe Church, Rosario Chapel, Loretto Convent, St. Katherine and the United States Indian schools, the New Mexico Industrial School for the Deaf and Dumb; Catholic, Presbyterian, Episcopal, and Methodist churches; the large Presbyterian Mission School, St. Vincent's Hospital, St. Vincent's Sanitarium, St. Vincent's Orphan School, besides many fine business blocks and pretty private residences. Here, side by side, are object lessons whereby the civilization of the seventeenth and eighteenth centuries can be studied in contrast with that of the present day as nowhere else in America.

Environed by protecting hills and thus exempt from strong winds and sand storms; surrounded by enchanting natural scenery; beautified by orchards and gardens of flowers; blessed with a climate that is free from extremes of heat and cold, and air that is pure and tonic; supplied with an abundance of pure water for domestic, manufacturing, and irrigating purposes from the extensive storage reservoir in the mouth of the Santa Fe Canyon; furnished with competing rail, express, and telegraph communication with all outside points; the headquarters of the Federal and Territorial officials; the meeting place of the legislature, the supreme court, the United States Court of Private Land Claims; the United States and Territorial district courts, and the various Territorial boards; the see of the archbishop of Santa Fe; the location of the New Mexico Historical Society and also of the Horticultural Society of New Mexico; a city having started a modern sewerage system; preparing to build two new modern brick schoolhouses up to the highest standard of excellence and possessing a fine public school system with a good high school and four ward schools, Santa Fe is naturally forging to the front as a popular residence town.

Santa Fe has, besides the cathedral, two other Roman Catholic churches, a Protestant Episcopal Church, an English and a Spanish Presbyterian Church, an English and a Spanish Methodist Episcopal Church.

The fraternal societies are represented by the Masons, including a chapter of Royal Arch Masons, a commandery of Knights Templar, and a Lodge of Perfection, the Masonic lodge being the oldest west of the Missouri and its lodge room containing many interesting relics. Then there are the Odd Fellows, Knights of Pythias, Elks, Red Men, Grand Fraternity, Woodmen of the World, Order of United Workmen, and other fraternities.

The United States maintains a weather bureau at Santa Fe.

The two reservoirs of the Santa Fe Light and Water Company, located above the city on the Rio Santa Fe, cost about $300,000, and consist of a large reservoir or artificial lake secured by means of a semicircular dam across the canyon—600 feet long, 350 feet wide, securely tied to bedrock, and 120 feet high, with mains and service pipes extending to every part of the city; and a smaller reservoir on

the hillside which, with a new ditch line from the canyon, supplies the power required to operate the city's electric-light plant, which is supplemented by a steam plant.

The city has the oldest bank in New Mexico. Its business houses command a large trade area, and it is the gateway through which passes a large part of the wool and other products of the Rio Arriba, Taos, San Juan, and Sante Fe counties, as well as of southwestern Colorado, bound for the South or for the East.

The Woman's Board of Trade of Santa Fe is a unique and characteristic institution. Its object is to advance every interest pertaining to the welfare and prosperity of the oldest city in the United States. This body is regularly incorporated under the laws of the Territory of New Mexico. The standing committees for work are: Finance, library, visiting and relief, intelligence, improvement, industrial, house, woman's exchange, prevention of cruelty to animals, reception and education, press, and cemetery.

The public plaza is entirely under the direction of the Woman's Board of Trade, and the city of Santa Fe appropriates $200 per year toward its support. A free public library of over 1,500 volumes and a free reading room, with all the leading magazines and papers, are open to the public.

It also owns a pauper burial plat for the benefit of those too poor to purchase lots, and has charge of the Fairview Cemetery and the Odd Fellows' Cemetery.

The visiting and relief work is the most important of all its branches, as hundreds are given relief in one way or another every year.

It recently erected in the plaza a memorial bronze fountain dedicated to the late Archbishop John B. Lamy, and was given by the thirty-fifth legislative assembly a fine building site near the plaza for a public library building.

EARLY HISTORY.

In 1541, when Coronado passed through the then unexplored country in search of the fabled Seven Cities of Cibola, he found an Indian pueblo or town already established where the present city of Santa Fe now stands. It was undoubtedly a place of much importance among the tribes who occupied the country at that time, as Coronado estimated the population at 1,500 souls. The many natural advantages of the location early attracted the attention of the Spanish settlers, and about the year 1605, perhaps sooner, it became a permanent Spanish town and the seat of government for that part of New Spain which was ceded to the United States in 1848.

On August 8, 1680, the Pueblo Indians, under the leadership of Pope, a Taos Indian, revolted against the Spanish and began a war of extermination on the invaders. So successful were they in the uprising that on August 21 of the same year the Spaniards were compelled to evacuate the town and retreat to a point near what is now the city of El Paso, Tex. As soon as the Spanish were gone Santa Fe was partially destroyed by fire. The churches and monastery were burned save the abode walls, the official documents furnished fuel for a huge bonfire in the plaza, and as far as possible all evidences of the Christian religion and civilization were wiped out.

Santa Fe, and in fact the whole province, remained in possession of the Indians until September 13, 1692, when Don Diego de Vargas

Zapata Lujan, at the head of 60 mounted Spaniards and 100 friendly Indians, after a battle of eleven hours, defeated the Pueblos and regained possession. After that memorable victory, which is still annually celebrated by a procession, the Spanish maintained their supremacy in New Mexico until August 18, 1846, when General Kearny, at the head of a force of United States troops, entered Santa Fe and took possession of it in the name of the United States. It is impossible here to go into details of the history of the city before or after the American occupation, interesting as it is, but in the light of that history no other city in the entire country is so rich in tradition and in memories of historic events as is this ancient city of Santa Fe.

PLACES OF INTEREST.

To enumerate all the places of interest here would require too much space for the purpose of this brief sketch, but a few of the most important are:

The Territorial library, containing many ancient Spanish and Mexican documents from 1605 to 1846.

San Miguel church, built in 1540, partially destroyed in the revolution of 1680, reoccupied in 1692, and completely restored in 1710, and partly rebuilt a few years ago. This is the oldest church in the United States, and contains many relics of the early days.

The capitol, the penitentiary, the United States Indian school, St. Katherine Indian School, the national cemetery, the Roman Catholic institutions, including a hospital, sanitarium, convent, Loretto Chapel, academy, and St. Michael's College, the Federal building, the Deaf and Dumb Asylum, the Presbyterian Mission School, the military reservation and the court-house, the old house believed to antedate the Spanish occupation; the cathedral of San Francisco, behind which is the chapel of the old parish church, with carved and painted reredos, both curious and interesting, erected by Governor Del Valle and his wife in 1761; the cathedral museum, containing many Spanish paintings and other objects of interest; old Fort Marcy, the commanding situation famous in all the sieges of the city, with ruins of the old fort; the garita, on the road to old Fort Marcy, at the west wall of which the leaders of the rebellion of 1837 were executed; the plaza in the center of the town, around which cluster many memories of the conquest of the land by the hardy Spaniards and of the stirring scenes of the more recent days. The soldiers' monument is located in the center of this park, and also a monument commemorating the taking possession of the city by General Kearny, as well as a memorial fountain to the late Archbishop John B. Lamy; the Perez monument, marking the spot where Governor Perez was assassinated; the Church of Our Lady of Guadalupe, with its large and interesting altar piece on canvass, containing six pictures of the appearance of the Virgin to Juan Diego, and other paintings and wood carvings; monument of Kit Carson in front of the Federal building; the Rosario Chapel, erected on the spot where De Vargas made his vow before the surrender of the city in 1692; the Masonic Hall, containing relics and the home of the oldest Masonic lodge west of the Missouri; the governor's palace, without doubt the most interesting of all the buildings. This is an adobe structure built in 1598, and continuously occupied by the Spanish, Mexican, and American governors for three hundred years.

The men who lived and conducted the affairs of state in the old pile included some of the foremost names, not only of the Territory but of the land.

To quote from a history of New Mexico, published some ten years ago:

Without disparaging the importance of any of the cherished historical localities of the East, it may be truthfully said that this ancient palace surpasses in historical interest and value any other place or object in the United States. It antedates the settlement of Jamestown by nine years, and that of Plymouth by twenty-two, and has stood during the two hundred and ninety-nine years since its creation, not as a cold rock or monument, with no claim upon the interest of humanity except the bare fact of its continued existence, but as the living center of everything of historic importance in the Southwest. Through all that long period, whether under Spanish, Pueblo, Mexican, or American control, it has been the seat of power and authority, whether the ruler was called viceroy, captain-general, political chief, department commander, or governor, and whether he presided over a kingdom, a province, a department, or a territory, that has been his official residence.

From here Onate started, in 1599, on his adventurous expedition to the eastern plains; here, seven years later, eight hundred Indians came from far-off Quivirato to ask aid in their war with the Axtaos; from here, in 1618, Vicente de Salivar set forth to the Moqui country, only to be turned back by rumors of the giants to be encountered; and from here Penalosa and his brilliant troop started, on the 6th of March, 1662, on their marvelous expedition to the Missouri; in one of the strong rooms the commissary-general of the inquisition was imprisoned a few years later by the same Penalosa; within its walls, fortified as if for a siege, the bravest of the Spaniards were massed in the revolution of 1680; here, on the 19th day of August of that year, was given the order to execute forty-eight Pueblo prisoners in the plaza which faces the building; here, but a day later, was the sad war council held which determined on the evacuation of the city; here was the scene of the triumph of the Pueblo chieftains as they ordered the destruction of the Spanish archives and the church ornaments in one grand conflagration; here De Vargas, on September 14, 1692, after the 11-hour combat of the preceding day, gave thanks to the Virgin Mary, to whose aid he attributed his triumphant capture of the city; here, more than a century later, on March 3, 1807, Lieutenant Pike was brought before Governor Alencaster as an invader of Spanish soil; here, in 1822, the Mexican standard, with its eagle and cactus, was raised in token that New Mexico was no longer a dependency of Spain; from here, on the 6th day of August, 1837, Governor Perez started to subdue the insurrection in the north, only to return two days later and to meet his death, on the 9th, near Agua Fria; here, on the succeeding day, Jose Gonzales, a Pueblo Indian of Taos, was installed as governor of New Mexico, soon after to be executed by order of Armijo; here, in the principal reception room, on August 12, 1846, Captain Cooke, the American envoy, was received by Governor Armijo and sent back with a message of defiance, and here, six days later, General Kearny took formal possession of the city and slept, after his long, weary watch, on the carpeted earthen floor of the palace.

Coming down to more modern times, it may be added that Gen. Lew Wallace wrote the greater part of Ben Hur in the old palace while governor of the Territory, in 1879 and 1880.

The immediate surroundings of the capital city are beautiful, picturesque, romantic, and interesting. The Santa Fe Canyon, the Tesuque Valley, Nagle's Sunny Pine Grove ranch, the Indian pueblos, the cliff dwellings, the Cochiti gold mines, the turquois mines, the Bishop's ranch, Box Canyon, the Divide, the Nambe Falls, the mountains towering to 13,000 feet in height, the lava fields, the crater, and many other grand and mysterious sights of nature's handiwork, are within an hour's to a day's journey by foot, burro, horse, or carriage.

At Santa Fe the Santa Fe River breaks from a wildly picturesque canyon through which a fine wagon road to Las Vegas over the Pecos River Forest Reserve and Sangre de Cristo range is being built. Mountain rises upon mountain in all directions and but 12 miles away, as the crow flies, Mount Baldy pierces the clouds at an elevation of 12,684 feet, and the Lake Peaks, close neighbors, are but a few feet lower. Both peaks are easily accessible by trails, and just between the

two summits of the Lake Peaks are lovely lakes of clear water. On these summits rise several sparkling trout streams, the Nambe, the Tesuque, the Rio Medio, the Santa Cruz, the Punchanella, the Santa Fe and its upper tributaries, all of them forcing their way through picturesque canyons and tumbling over cliffs in sparkling cascades or roaring waterfalls. The main falls on the Nambe are especially worth a visit, the road from the city being good and winding through the Tesuque Valley, one of the most attractive orchard spots in the West, through the Tesuque Indian pueblo, Cuymungue, and skirts by the Indian pueblos of San Ildefonso, Pojoaque, and Nambe, which latter with its red-roofed church reminds the traveler of a Moorish village, and then along the Nambe up to the falls. The trip, like so many others of equally romantic and scenic interest in this vicinity, can be made in one day.

Another pleasant outing is up the Santa Fe canyon to Monument Rock, from where one trail leads to the Lake Peaks and another to the Pecos River, the finest trout stream in New Mexico. This trail will become part of the famous scenic road across the Pecos Forest Reserve, which is being constructed at present between Santa Fe and Las Vegas, and along which a number of summer resorts and hotels will spring up.

Nor should the visitor miss a three or more days' trip to the cliff dwellings, 30 miles northwest of Santa Fe. The most traveled road lies through the rich and fertile Espanola Valley, with its cluster of villages, and then follows the beautiful Santa Clara canyon to the mesas upon which are situated the communal houses, containing in some instances 1,800 rooms and towering above the cliffs in which are the cliff and cave dwellings, with their remnants of pottery, weapons, and other relics. Further away stretch the Cochiti and Jemez mountains, several peaks rising to an altitude of almost 13,000 feet. In the Cochiti range is the famous gold mining camp of Bland, connected with Santa Fe by a good wagon road, and in the Jemez Range are the wonderful Sulphur, Jemez, and San Antonio Hot Springs and the sulphur works of M. S. Otero. Farther to the north are the Ojo Caliente Springs and the beautiful and romantic Taos Valley with its fertile fields and orchards, the mining camps of Twining, Bromide, and many others, all easily accessible from Santa Fe in one day's journey.

There are 20 mountain peaks over 10,000 feet high a few miles from the city, all easily climbed, for Santa Fe being 7,000 feet above sea level, the climb even to the top of Mount Baldy is less than 6,000 feet. Box Canyon, the Bishop's ranch, the Cajon Grande Canyon, the Macho Canyon, the White Rock Canyon, fine panoramas from divides and mountain heights, are all attractions which the tourist should view and visit before leaving the City of the Holy Faith.

Then there is the Aztec Spring, or the Ojo Del Gigante, on the western slope of Santa Fe foothills, 2½ miles east from Santa Fe; the turquoise mines at Turquesa, 12 miles distant; the bottomless crater and lava fields, 8 miles from Santa Fe; the coal mines at Madrid, O'Mara, and Hagan; the salt and alkali lakes on the Estancia Plains, all easily reached from Santa Fe in a few hours. The mountains, the pine forests, the mining camps, afford sights well worth beholding, and accessible by good roads, trails, or railroad. Santa Fe will well and truly repay a visit of even a single day, if the tourist can not

TWO VIEWS OF SUNMOUNT TENT CITY AT SANTA FE.

spare more time, but to know and appreciate all of its attractions and beauties one must stay a season or linger a year or two.

A city at the junction of three railroad systems, the Atchison, Topeka and Santa Fe, the Denver and Rio Grande, and the Santa Fe Central is bound to be intensely modern. Santa Fe has electric-light works; it has waterworks and reservoirs that supply the city with pure cold water from uncontaminated sources; it has large wholesale and retail business establishments; an excellent public school system; social advantages such as are naturally the attribute of a Territorial capital and ancient commercial center with its traditions going back more than three hundred years; it has a splendid cab service and fine hotel accommodations; besides a sanitarium conducted by the good Sisters of Charity, and a tent city, which offers unlimited accommodations to the transient visitor, as well as to the permanent settler, and an ideal home to the health and rest seeker.

The tent city is adjacent to Santa Fe and is located at the foot of the picturesque Sangre de Cristo range (which only a few miles away rises to an altitude of 13,000 feet) on a mesa sloping gently to the southwest and thus facing the sun, overlooking the laughing and picturesque Santa Fe Valley with its orchards and beautiful homes, churches, and public buildings, and protected on all sides by cedar and pinon-clad foothills. It is an all the year round sunshiny and pleasant health and pleasure resort. Sunmount is laid out in wide avenues, is provided with the purest of mountain water, is connected with the city by telephone, has the most beautiful and romantic surroundings, and is a little over a mile from the union depot and the Atchison, Topeka and Santa Fe depot. At Sunmount a commodious lodge and restaurant has been erected and a pavilion and casino large enough for dancing parties and theatricals is in course of construction, far enough from the tents not to be annoying to those who love quiet, and yet near enough to be convenient to the denizens of this ideal community which is high enough to be in the clouds, yet has only one cloudy day in every twelve. The tents are of durable material, solidly constructed, and can be rented furnished or unfurnished. Each tent is surrounded by ample grounds, thus assuring privacy and providing isolation and yet avoiding loneliness. Sunmount is planned somewhat upon the lines of the famous tent city on Coronado Beach, California, only that unlike the famous California resort, it will be open all the year around, and that it is especially adapted to those seeking health and rest. At Sunmount the health seekers can find the ideal attributes for regaining their health—an outdoor life in the purest air, the most constant sunshine, the most perfect conditions of weather, altitude, and surroundings which are advocated by physicians as best tending to their recovery from any chronic illness or after-effects of acute sickness. The summer nights are invariably cool, thus assuring rest to the weary sufferer, while during the day in the shade the thermometer never exceeds 90°, although the sun's rays are sufficiently strong both in summer and winter to act as a veritable tonic. In winter the mildness of the atmosphere is not such as to be enervating, although the penetrating rays of the sun take the edge off the cold and there is scarcely a day when a person will not feel comfortable while sitting in the sun and protected from the wind. For moderate exercise the winter as well as summer days are ideal. Sunmount has no dust storms, snow

does not lie on the ground very long, there is an utter absence of mosquitoes and other insect pests, and of enteric diseases. As a matter of fact, a number of cures from affections of the lungs and throat, including tuberculosis, are reported, although the tent city is not yet a year old.

The near-by Sunny Pine ranch offers an opportunity for securing daily fresh milk and vegetables, while the surrounding mountain and forest scenery offer brief outings. As rapidly as they can be secured, more tents will be provided, every modern improvement and convenience will be installed, trees will be planted to shade the wide avenues, and ultimately a large hotel and other buildings will be erected.

But the health seeker need not go to Sunmount to secure the climatic advantages that Santa Fe offers. He can pitch his tent anywhere on the wide mesas or in the protected canyons and there grow well by living outdoors and paying attention to simple hygienic rules. Santa Fe justly boasts of having the finest climate in the world. The entire Rocky Mountain region is noted for its health-giving climate, and at Santa Fe that climate reaches its highest perfection. Here the winters are mild and sunshiny and the summers cool, the thermometer seldom reaching 90° even in July or August, and never a hundred. The nights are invariably cool so that blankets are welcome even in the dog days. Here sand and dust storms are reduced to a minimum and the dry, antiseptic, light air laden with the perfume from pinon and cedar is balsam to the diseased throat or lungs and a continued delight to the well person. There is an absolute absence of mosquitoes and other insect pests. When it is remembered that in the many orchards of Santa Fe is raised the finest fruit in America, not even excepting California, and that there are more hours of sunshine in the year at Santa Fe than at any other point where the United States maintains a weather bureau, excepting Phoenix, it will be acknowledged that a season spent at Santa Fe, or even a brief visit, must be a treat that the tourist coming to the West should not miss.

Nor must it be forgotten that the vicinity of the city offers good hunting of bear, mountain lion, coyotes, and smaller game; that the Pecos, the Santa Clara, the Santa Fe, and other streams are splendid fishing grounds; and that the peculiar fauna and flora of this arid mountain region offer much that is peculiar, interesting, and worthy of note. The intending home seeker should also remember that in Santa Fe and surroundings agriculture is carried on with the aid of irrigation, which means that the farmer is always certain of his crops, for he can apply moisture to them when they need it and withhold it when moisture is not needed.

Santa Fe does not depend alone upon tourists, health seekers, and officials for its existence. Good crops are raised in the Santa Fe and adjoining valleys, the orchards of Santa Fe are revenue producers; dainty filigree jewelry is manufactured here; an excellent quality of brick is manufactured; in the surrounding Indian pueblos baskets and blankets are woven, pottery manufactured, and beadwork is made that finds a ready sale all over the United States. Santa Fe is a thriving railroad and mercantile center supplying a vast region, and there are manifold natural resources that are just being developed. Not only historic memories and landmarks make Santa Fe a spot well worth a visit, but the beauty of its location, like a jewel in the lap of the mountains, its perfect climate and its many present day interests, make

it the most interesting spot between New York and San Francisco. Santa Fe with its suburbs has a population of 8,700.

Draw a circle of 50 miles radius with Santa Fe as the center. It will take in the heart of New Mexico. Within it will be found a score of producing mining districts. Not only gold mines, but mines of silver, copper, lead, iron, coal, turquoise, quarries of marble, building stone, limestone, beds of clay, deposits of gypsum, veins of mica, and prospects of other minerals in abundance.

In that circle are found some of the best agricultural lands in the Southwest. There are raised the best fruit, the best sugar beets, the best grain in the world. Take a peep at the Española, the Tesuque, the Chama, the Taos, and other valleys. Within that circle there is room and chance for profitable irrigation enterprises. In that circle flow the waters of the Rio Grande, the Pecos, the Chama, the Santa Fe, the Tesuque, the Nambe and Rio Pueblo, the Truchas, the Pojoaque, the Santa Clara, the Galisteo, and other streams, all perennial rivers with a never-failing water supply in their upper courses.

In that circle are found the water power, the fuel, the raw material for a hundred great industries. The circle is the most densely populated area in New Mexico or Arizona, and offers cheap and plentiful labor for industrial enterprises and at the same time a good market. Mexico, Central America, and the Orient are nearer with their market to it than they are to the Eastern and the Northern manufacturing centers.

In that circle are very superior sheep, cattle, and goat ranges, and extensive virgin forests.

New Mexico has the finest climate in the world, and in that circle is the best climate in New Mexico. Within the circle is the great Pecos River Forest Reserve, which insures forever a bounteous supply of water, a summer retreat for tourists, health seekers, pleasure seekers, sportsmen, or the tired man and woman who seek rest in communion with nature in its most sublime or gentlest moods.

In that circle are located the world famous cliff dwellings, the pyramids of America north of Mexico, ten Indian pueblos, the oldest buildings in the United States, a hundred spots which awaken memories of the romance of the great stretch of time between the coming of the Conquistadores and the supplanting of the Santa Fe trail by the steam railroads.

It is a circle invaded by three great railroads and their important branches and connections, a circle near whose circumference are located the cities of Albuquerque and Las Vegas, with which Santa Fe form the three largest and most important towns in New Mexico. The center of the circle is the most advertised spot in the United States, a town whose name is one to conjure with, a name given to one of the great transcontinental railway systems, a town whose very name is an invitation to the health seeker, to the tourist, the capital of the coming Sunshine State, the county seat of one of the most densely populated and richest counties of the Territory, an archbishop's see, the location of many Federal, territorial, Catholic, and Protestant church institutions, a town most charmingly situated, with a peerless climate all the year around, and a better summer climate than possessed by any summer resort in the world, a town free from native consumption, malaria, enteric diseases, mosquitoes, excessive summer heat, and

having superlative advantages that no other town in the great Southwest possesses.

These and many more are the resources, the attractions, the advantages, the hub of which is the city of Santa Fe. Certainly in view of all this there is nothing that can prevent Santa Fe from becoming a large and hustling city.

RATON.

Raton, the county seat and largest settlement in Colfax County, is one of the most prosperous and progressive cities in the Southwest. The last census gave it a population of 3,450, but with its suburbs it now has 8,000 people and is adding to its population at the ratio of 10 per cent a year. It is called the Gate City of New Mexico, and is the fourth in population among the cities of the Territory, Las Vegas, San Miguel County, according to the census, exceeding it only by 12 population, Santa Fe, Santa Fe County, by 2,100, and Albuquerque, Bernalillo County, by 2,600.

In the ten years from 1890 to 1900 it increased its population 200 per cent, or more than any other city in New Mexico, excepting Roswell. It is situated in the shadow of Raton Mountain and is in the center of the finest coal belt in the Southwest, surrounded by prosperous stock ranges, and has tributary to it a splendid agricultural section. It is also in the most promising oil field in New Mexico, and is an important division point on the Atchison, Topeka and Santa Fe Railway, the company maintaining extensive shops. Over $50,000 a month are distributed by the railroad company at this point. All the trade of the coal camps of Gardiner, Blossburg, and Willow is transacted at the Gate City, which means a monthly pay roll of $100,000 in and about the city. The commercial lines are all well represented, and a considerable wholesale business is done with the surrounding settlements and the more distant mining and lumbering camps. The town has an excellent gravity water system, the water being from the Chico Rico, a pure, purling mountain stream with clear, crystal water. The water is piped from a reservoir of 52,500,000 gallons capacity, 500 feet above and 6 miles from the city. Raton has a good fire department and two of the finest school buildings in the Southwest. The streets are well graded and lighted by electricity, and the recently constructed court-house is a very handsome building. The Atchison, Topeka and Santa Fe Railway has completed the plans for a $50,000 depot which is now under construction. The people of Raton are making effort to secure a beet-sugar factory, a flour mill, a creamery, and other industries. The city has two banks, an opera house, long-distance telephone connection with Colorado points, cheap coal, lumber and building material, and a building and loan association. It has a number of beautiful churches representing several Protestant denominations and the Roman Catholic faith.

Four weekly newspapers are published, The Range, The Reporter, The Gazette and El Tipografica. The elevation is 6,668 feet. The city attracts many health seekers who find here an ideal climate and splendid accommodations.

ROSWELL.

Roswell, situated in the commercial, linear, and geographical center of the Pecos Valley Railroad system, is the seat of Chaves County,

STREET SCENE IN ROSWELL DURING THE STREET FAIR.

located near the confluence of the abundant waters of the Pecos and Hondo rivers, the supply and shipping point of an immense range area for both cattle and sheep, surrounded by fertile lands and exhaustless irrigation resources, including both the canal and the artesian wells. Roswell is daily adding to its record as one of the most active and prosperous business centers of New Mexico.

The city has largely increased both its business and residence population since the completion of the Pecos Railroad system to its northern and eastern connections at Amarillo, and now with a present population of over 4,200 bids fair to count within the next two years 6,000 people, especially since it is claimed that the Pecos Valley Railroad is to be extended southwest to El Paso to form a part in a new system of roads that will link the northern lakes with the Gulf of California.

The city is replete with brick business blocks and residences; is the site of the New Mexico Military Institute, has two large public schools, two newspaper plants, substantial banking interests, an elegant and commodious club, an ice factory, many churches, numerous and ever being added to wholesale and retail houses, and tributary and extensive stock yards. The Roswell climate is noted for its healing effect on all pulmonary troubles, and every succeeding year sees added an influx of healthseekers.

ALAMOGORDO.

Alamogordo, the county seat of Otero County, 4,500 feet above sea level, has experienced the most remarkable growth of any city in New Mexico. Four years ago the town was established, and it has to-day almost 4,000 inhabitants, broad streets, brick business blocks well stocked with merchandise, five churches, two large saw mills costing over $200,000, an electric-light plant and ice factory, steam laundry, planing mill, a water-works system which cost $50,000, a railway hospital, a woman's club, a park a mile long, fraternal organizations, three weekly newspapers, a fine railroad depot, a modern and commodious hotel, splendid public school building, and a public library. The general offices of the El Paso and Northeastern Railway are located at Alamogordo. Also the Southwestern Baptist College, whose promoters are improving a suburban tract and establishing a great educational institution. They will this year build a street railway. The streets are lined with young shade trees, and here and there about the city are dotted beautiful parks. New enterprises that add to the prosperity of the town are constantly springing into life. It is believed that artesian water underlies a large district in this region, and wells will be bored. The Territory has appropriated $25,000 for the erection at Alamogordo of an asylum for the blind, and construction will be begun at once.

When, four years ago, the Alamogordo Improvement Company was organized, the bare acres of the townsite were all that was visible. With a capital of $500,000 and an unlimited fund of foresight and energy the company began work. The original townsite purchase was 1,200 acres, and from the signing of the title deeds to the present time the company has expended in cash $400,000, of which $175,000 was for a city water system, $115,000 for city and suburban irrigation, and the remaining $110,000 for buildings, street and alley construction, and improvements for parks and other city purposes. The city-water

supply is brought 12 miles from springs in Alamo Canyon, the last 8 miles of the distance being piped. The system has a gravity pressure of 100 pounds to the square inch. The company platted its land into city lots and 1 acre suburban tracts, and has brought the waters to its irrigating system from La Luz Canyon, 7 miles away.

A $25,000 court-house has been constructed, and a $30,000 railway hospital is to be built, while Eastern capital has about appropriated $250,000 for a modern sanitarium, plans for which are now being arranged. A $75,000 tie-preserving plant has been built. The town is the geographical and commercial center of one of the finest fruit-growing sections beneath Southern suns; has thousands of tributary fertile acres open to Government entry; is on the main line of the shortest route between Kansas City, Denver, and El Paso to California and Mexico, and is within two hours' jaunt of the famous Cloud City—the aerial summer and scenic Southwestern resort.

GALLUP.

By the McKINLEY COUNTY REPUBLICAN.

The town of Gallup is located in the western part of McKinley County, Territory of New Mexico, on the Santa Fe Pacific Railroad. Within and around the city are vast resources needing only the stimulus of capital richly to repay the investor.

Gallup has at the present time a population of 3,200 people, including, of course, the families in the coal camps of the various companies, lying at short distances from the city limits. For a western city the social tone of residents is very superior. As many other western towns, Gallup possesses a notable contingent of thrifty, brainy Scotch, English, and Irish folks, who have added very materially to the rapid growth and solid development of the community.

The climate is dry, fairly equable, and with as few disagreeable features as could be found in any climate. The high altitude prevents the excessive heat characteristic of so many towns in the Southwest.

The city has ample religious and educational facilities. The Methodist Church was established in 1888 by the Reverend Bush. Rev. Robert Hodgson is the present pastor. Next was the Roman Catholic Church, established by the Reverend Father Brun. Reverend Father Juillard is the present pastor. In 1892 the Episcopalians began a work here under the care of their missionary, Mr. E. A. Osborn. Rev. W. R. Seahorne is the present pastor. The Congregational Church was organized by Rev. P. A. Simpkin, a home missionary of that church. Rev. George Leo Patterson is the present pastor.

The public school system is a most excellent one and would do credit to a much larger city than Gallup. Here the children receive just as good an education and preparation for college or university as in any small city in America.

The city is well represented by civic societies, such as the Masons, Knights of Pythias, I. O. O. F., Rebekahs, Woodmen of the World, United Moderns, Italian Society, Sons of Herman.

Thirty Indian trading stores on the reservations get their supplies from Gallup merchants or by the way of Gallup.

In handling the municipal affairs the board of trustees has been very efficient. The present officers are: Board of trustees, E. M. Clayton, chairman; John Sharp, Peter Kitchen, W. E. Weidemeyer, Louis Meyers; Joseph Morello, treasurer; K. K. Scott, clerk.

The McKinley County Republican is the only paper in the county. In politics it is Republican.

The advantages of Gallup are something that should not be overlooked as the town is way ahead of most cities of its size. Gallup is the metropolis and county seat of McKinley County. It is above all a coal-mining town and its coal industry is practically thus far only partly developed. Underneath the whole region of which Gallup is the center, immense deposits of coal have been treasured by nature, awaiting the thrifty hand of capital to bring it up to the surface and make of Gallup the richest coal-mining town of the Southwest. One mine alone, the Weaver mine, property of the Colorado Fuel and Iron Company, produced in one day (June 22, 1903), 1,550 tons of coal. The coal can be dug easily and there is practically no danger for the miner in the mines unless he should be exceedingly careless. No gas is to be feared. The coal is soft and of best quality.

A briquette plant had been of late built near the town and promised to be a great help to the coal-mining industry, but it burned down recently. The slack can be used to great advantage and sold to railways and steamers under the form of small coal bricks. The plant will probably be rebuilt. A railroad will soon be built between Durango and the southern part of Arizona, passing through Gallup, giving two railroads to the town.

The coal trade would naturally give the city a steady growth, but it is only one of the many resources. Lying north of the city is a vast field rich in oil-bearing sand and shale, samples of which experts in Pennsylvania oil fields have pronounced to be very rich in crude oil (kerosene).

A vein of fire clay, very free from iron and nodules, and of excellent quality, underlies the whole region, small and steady orders therefor being supplied to Arizona smelters.

Excellent pottery clay, brick clay, valuable sands, good grade copper ore, and other natural riches are in the neighborhood in profusion.

The greatest of all resources, however, lie above the ground. The whole valley is filled for miles with rich soil, needing only water to make it one great rich farm. Nature has kindly made a reservoir 4 miles above the town, which drains an immense watershed that would supply an abundance of water for the irrigation of the whole valley. Only a moderate amount of capital is needed to dam safely this site and to set going agricultural life that would make Gallup a much larger city and also give handsome returns for the money invested.

The city is lighted by electricity, has waterworks, a telephone system, and commands the trade of a large territory. It has broad, clean streets and many of its buildings are of brick and stone. It has telephone connection with the surrounding coal camps and Fort Wingate. It has a large roundhouse and is a division point on the Santa Fe Pacific Railway.

LAS CRUCES.

By EDWARD C. WADE, *Secretary of the Mesilla Valley Chamber of Commerce.*

Las Cruces, the "City of the Crosses," the county seat of Doña Ana County, is beautifully situated 40 miles north of El Paso, Tex., on the eastern edge of the far-famed Mesilla Valley and in the midst of the largest body of agricultural land within the Territory. This valley has an average width of about 5 miles and is about 70 miles in

length, embracing about 100,000 acres of the rich alluvial soil of the Rio Grande. However, only a comparatively small portion of the valley is under cultivation, perhaps 30,000 acres in all. Of course all cultivation is by irrigation. For this purpose the Rio Grande furnishes an abundance of water usually, but in late years there have been occasional droughts for brief periods; but the farmers and orchardists have within the last few years learned that there is an inexhaustible flow of water under the surface of the ground at a depth of about 25 feet and that it is perfectly feasible and profitable to utilize this under-surface flow to supplement the river in times of scarcity. Consequently a number of pumping plants have been erected in different parts of the valley and are now in use whenever required. When it is considered what has been accomplished in California by the use of water raised by means of pumps for irrigation, the advantages of the valley in this respect may be partially realized.

The town of Las Cruces was laid out in the year 1848. at the close of the Mexican war, by American officers from the post then existing at Fort Selden, 18 miles above the town. Before that time the valley had been the habitat of the Apache Indians, who were so numerous and fierce that no one dared to settle at points in the valley outside of the little hamlet 6 miles above the town, and the lands of the valley were totally unutilized. But with the protection which came with the American occupation of the country settlers rapidly came, and the valley now has a population of approximately 10,000 souls. Las Cruces is the largest town in the valley. The census of 1900 gave the two precincts in which the town is located a population of 2,906. The town proper has at present a population of 3,000. The other settlements in the valley, almost contiguous to the town, are Mesilla Park, Mesilla, Colorado, Rincon, La Mesa, San Miguel, Chamberino, Garfield, and Anthony.

The town is regularly and symmetrically laid out, and in parts well shaded. It has an altitude of about 3,800 feet. This altitude, combined with the latitude, renders the winter months the most delightful in the world, while the heat of the summers is tempered and cooled with the rains which come about the 1st of June and extend into November. The town has a solid and substantial basis for its prosperity. It is essentially an agricultural town, dependent in the main upon the prosperity of the neighboring farms and orchards for its welfare. There are about twenty general merchandise stores and the usual assortment of drug stores, banks, hotels, restaurants, saloons, and offices of professional men. The town is not entirely dependent, however, upon the prosperity of the farmer and the orchardist. It is far from being a one-industry town. A few miles to the east are the beautiful Organ Mountains where gold, silver, copper, and lead have been, and are being mined profitably, contributing to the prosperity of all classes in the town. There are also on the neighboring ranges many cattle, sheep, and goat ranches, which are in a healthy condition. Within 2 miles of the town is the College of Agriculture and Mechanic Arts and the agricultural experiment station. These are institutions endowed liberally by the National Government and the Territory, and under their supervision. They are largely patronized by students from all parts of the Territory, from the neighboring sections of Texas and Mexico, and receive some students from almost every State in the Union, who come for the sake of the opportunity

afforded to acquire a knowledge of the Spanish language and Spanish stenography. The town, too, has in late years become the Mecca of an ever-increasing class of persons afflicted with lung and throat troubles. These unfortunates have found in the mild winters and dry atmosphere the exact conditions necessary to restore them to health. Some of them make it a practice to come every fall and winter, while others purchase themselves ranches, farms, and orchards, and settle down into permanent residents. The "Alameda" is a resort built and managed exclusively for the benefit of this class of sufferers, and it enjoys an increasing patronage every year.

Las Cruces is the seat of the United States district court and of the United States land office. The United States court has jurisdiction over all the territory comprised in the counties of Doña Ana, Grant, Luna, Sierra, and Otero. The territory embraced in the land district is somewhat larger. Judge Frank W. Parker, the presiding judge of the court, makes his residence at Las Cruces, as does also Hon. Nicholas Galles, the register of the land office.

Besides "the college" the town has two graded and well-managed public schools and one or two private schools. The Sisters of Loretto, a Catholic order, maintain an educational institute, which enjoys a large patronage and is deservedly popular. It is under the charge of Sister Albertina.

The Roman Catholics, the Presbyterians, the Methodist Episcopal, and the Baptists have good, healthy church organizations. Three English weekly newspapers—the Las Cruces Progress, the Citizen, and the Rio Grande Republican—are published at Las Cruces, and two Spanish weeklies—El Labrador and El Tiempo. At the college a monthly is published. The fraternal orders are well represented, the Masons, Woodmen, Odd Fellows, and others having lodges. The town also has a thriving chamber of commerce, which is doing much in making the advantages of the town and valley known to the outside world. The secretary takes pleasure in answering all inquiries touching the Mesilla Valley.

A canning factory enjoys an extensive patronage, and the demand for its products is greater than can be supplied.

SILVER CITY

By JOHN W. FLEMING.

A "silver city" with a golden climate is located in the southwestern part of the Territory, in the foothills of the Rocky Mountains, at an altitude of 6,000 feet above sea level. It is the county seat of Grant County, and is reached from all points by the Atchison, Topeka and Sante Fe Railway, which has its New Mexico terminus here. Its location, protected on all sides by high hills, its dry, rarefied atmosphere, and its constant sunshine, make Silver City an ideal residence for persons afflicted with tuberculosis. Nine miles east of Silver City is Fort Bayard, where the United States Government has located the army and navy general hospitals for the treatment of tuberculosis. The Government having put its stamp of approval, after careful investigation, upon this climate for the cure of its soldiers and sailors, many other health seekers of late have been attracted to Silver City and surroundings.

The census of 1900 gave Silver City a population of 2,735 and Silver

City precinct a population of 2,971. The present population of the city is 3,000. It is a well-built town of brick business blocks and many beautiful brick residences. The city has a good supply of water, both for domestic use and for fire protection. Its merchants are modern and progressive, and large stocks of goods are carried because the city supplies a large area of prosperous country. Two weekly newspapers are published, the Silver City Enterprise and the Independent. The city's public school system is excellent, and there is also located here one of the two Territorial normal schools, with a fine corps of teachers. Another educational institution that does most excellent work is the Academy of Our Lady of Lourdes.

The city has a first-class electric-light plant and a telephone system that reaches out to all the important towns and mining camps of the county. The Roman Catholics, Protestant Episcopal, Methodist Episcopal, Baptists, and Presbyterians have substantial church buildings, with parsonages. The fraternal orders are well represented by the Elks, the Masonic blue lodge, chapter, and commandery, Knights of Pythias, Ancient Order of United Workmen, Eagles, Odd Fellows, Red Men, Maccabees, Eastern Star, and Daughters of Rebekah, all of which are in a flourishing condition.

The Silver City National Bank and the Silver City Savings Bank are the two financial institutions of the county, and are among the strongest in the Territory. The city has four good hotels, where first-class accommodations can be had—better, in fact, than in most towns with twice the population of Silver City. The industries of the surrounding country are stock raising and mining. Twelve miles to the west of the city is the Burro Mountain mining district, principally copper, yet also producing much of the turquoise sold in the United States. Nine miles north is located Pinos Altos, one of the oldest gold camps in the Territory. Nine miles east is Fort Bayard and the town of Central, while 16 miles east are located the towns of Santa Rita, Hanover, and Fierro, right in the heart of the big copper and iron district. The climate of this section makes it possible to carry on mining every day in the year, both on top and under ground.

The climate also makes stock raising a greater success in Grant County than in the Northern States, where the extreme cold in winter causes heavy losses.

At Silver City is situated a smelter, capable of treating 300 tons of ore every day.

The legal profession is represented by nine attorneys, the medical profession by six physicians, and there are two dentists. The courthouse is a large three-story building of brick, erected at a cost of $50,000, and contains, besides the large and commodious court and jury rooms and county offices, the county jail.

St. Joseph's Sanitarium, under the care and direction of the Sisters of Mercy, is situated on a high elevation in the western part of the town, and consists of two large brick buildings, containing about thirty rooms, which are modern and up to date in every way. There is also located here the county hospital, under the management of the Ladies' Aid Society. Both of these institutions receive an annual appropriation of $2,500 from the Territory.

Silver City was incorporated in 1878, under a special charter. Its affairs are administered by a mayor and board of councilmen consisting of four members. The present mayor is enjoying the distinction

of holding the office for seventeen years. The city officials are: Mayor, John W. Fleming; councilmen, G. W. M. Carvil, J. J. Kelly, R. M. Grabe, Jackson Agee; clerk and collector, Howard H. Betts; city attorney, R. M. Turner; city engineer, G. R. Brown; marshal, W. H. Kilburn; police judge, W. H. Newcomb.

DEMING.

By Miss LILLIE M. BILLINGSLEA and N. S. ROSE.

The city of Deming, county seat of the county of Luna, was founded in November, 1881. The Southern Pacific Railway, which was then building toward the Pacific coast, had just reached this point and was making preparations for building shops, etc., furnishing an incentive for the building of a city of tents and shanties on the plains. Six months later the Atchison, Topeka and Santa Fe completed its line to that point and formed a junction with the Southern Pacific and assured to Deming a position of prominence in that part of New Mexico. During the year 1882 settlers flocked in, and several substantial buildings were erected. The plains round about also began to settle up, especially in spots where water was found. These new settlers were engaged in the cattle industry, and that industry has since then furnished a substantial support to the town. Prospectors located claims in the mountains round about, and as a consequence the mining industry, too, has and is contributing to the prosperity of Deming and has helped to make it an important business center. About a year after the completion of the railroads above mentioned, the Atchison, Topeka and Santa Fe built a branch into the mining district surrounding Silver City, which was then enjoying a boom. From that time on Deming enjoyed ten years of uninterrupted prosperity, until, in common with the entire Southwest, it received a setback through the panic of 1893 to 1894 and for a time was dormant. But its superior natural advantages, its railway facilities, and its solid business institutions helped the city to recover from the effects of an unsettled financial condition which prevailed, and by 1900 new business houses were again being built and cozy residences were being added one after another to those already in existence. In 1901 work was started on the construction of the El Paso and Southwestern Railway, the road being completed the year following, giving Deming direct railway connection with the great mining region of southern Arizona and of Sonora, Mexico, and giving it the distinction of being one of the three cities in New Mexico, namely, Santa Fe, Deming, and Lordsburg, having three railroads. During the past year two other important railroad lines have extended surveys into Deming, one being an Alamogordo-Deming cut-off for the El Paso and Northeastern Railway and the other a survey of the Colorado and Gulf Railway from Durango, Colo. It is safe to say that the city is now entering upon a period of prosperous growth which will surpass any advancement that its past history shows and will confirm its position as one of the leading towns of the Southwest.

The location of Deming is an ideal one, standing as it does on a broad, level plain at an altitude of about 4,300 feet, and surrounded with picturesque mountains. It always enjoys a cool, refreshing breeze in summer, tempering the heat of July and August, and rendering the nights delightfully cool and pleasant, while its southern latitude prevents severe cold in winter and assures a mild, even temperature the

year around. From a commercial point of view also it is the natural supply point of a vast region of country, furnishing supplies for the cattle ranches for miles to the east, west, and south, and for the farmers of the great Mimbres Valley to the north, while the mining camps in the various parts of Luna and Grant counties to the west and to the north come to Deming for their supplies and to ship their ores. The water of Deming is noted for its purity and the abundance of the supply, the Mimbres River sinking into the gravel about 20 miles north of Deming, running beneath the surface in an inexhaustible stream directly under the town. The water is as pure and soft as rain water, this making the town, with its excellent railway facilities, a particularly favored point for manufacturing enterprises. A smelter, especially, has been projected recently, and will undoubtedly be built at no distant day, as Deming is an ideal point for a smelting center.

Deming has a population of about 2,000, and is incorporated under the village incorporation act. The board of village trustees consists of Seamon Field, chairman; J. W. Hannigan, A. J. Clark, T. A. Carr, and L. H. Brown. Judge Edward Pennington is police magistrate and Frank Prizer marshal.

As the supply point for the surrounding country the town has a large trade in provisions and such goods as are used in the camps. Merchandising is therefore the most important industry at present, there being a number of large, well-equipped general merchandise stores in the town, which command an extensive trade. Next in importance is the shipping of stock, about 100,000 head of cattle being shipped annually during the early summer months. Another industry bringing large returns is traffic in hay. The vast plains surrounding the town furnish thousands of tons of hay, and teams may be seen every day during the winter months hauling and loading it on cars for shipment to the mining camps and to the towns east and west of Deming. During the latter part of the summer and fall a considerable business is done in shipping fruit and melons from the Mimbres Valley ranches, and a considerable sum of money is thus placed in circulation in the town. A brickyard owned by Barney Martin does a good business, as the greater part of the business houses built during the past few years are substantial brick structures which add materially to the appearance of the town. Last year several local business men erected an ice plant and electric-light works, which have been in constant operation since completion. These enterprises are prospering, and extensive improvements are contemplated for the future. A business which offers a splendid opening and promises good returns to enterprising people is market gardening. Several parties are engaged in it at present, but are not able to supply one-half of the demand, which is growing steadily. One man having 10 acres in garden truck has cleared $4,000 annually from this business. The town has a solid banking institution, the Bank of Deming. Its officers are J. Sloat Fassett, president; John Corbett, vice-president; L. H. Brown, cashier, and W. H. Guiney, assistant cashier. Another firm is arranging to establish a bank in the near future.

The town is well represented among the fraternal orders, there being at present thrifty lodges of the following: A. O. U. W., Deming Lodge No. 7, T. A. Carr, recorder; A. F. and A. M., Deming Lodge No. 12, Edward Pennington, secretary; O. E. S., Ruth Chapter No. 6, Mrs. Mattie Pennington, secretary; R. A. M., Deming Chapter No. 5,

Edward Pennington, scribe; R. and S. M., Deming Council No. 1, G. A. Shepard; I. O. O. F., Deming Lodge No. 6, Charles Miller, secretary; W. O. W., Florida Camp No. 4; K. of P., Deming Lodge No. 20, C. C. Raithel, keeper of records and seals; Improved Order of Red Men, Huachuca Tribe No. 18, Wright Lahan, chief of records. The Adelphi Club is an organization of about 100 business men, which has fitted up elegant club rooms and which is doing good work for the growth of the city.

The Deming Hospital is a Territorial institution established in 1897. It is in charge of a society of which all women in Luna County interested in the work may become members. The board of management consists of a president, a vice-president, a secretary, a treasurer, and five directors. The directors have complete supervision of the management, such as the furnishing of supplies, auditing the accounts, determining the number of the employees and the salary to be paid them, as well as the rules for government of the hospital.

Deming has always been noted in the surrounding country for its excellent public school facilities. The present school building was erected in 1892. It originally contained six rooms. The building, which is a very handsome brick structure, was enlarged to eight rooms in 1902. Attractive grounds surround the edifice. They are planted with about 100 trees, as well as with rosebushes and shrubbery. There is a well-kept lawn. The grounds are irrigated from a 22,000-gallon tank. Twelve years of work are embraced in the curriculum—eight in the elementary and grammar grades and four in the high school. The school library contains over 600 volumes, including the full set of 39 volumes of the works of Hubert Howe Bancroft, the historian. Three medals are awarded to the members of the graduating class each year. One is for the highest average in all studies, donated by the school board; one for the highest average in mathematics and one for the highest average in English, the latter two medals being donated by persons interested in the school's welfare. The school term is nine months and 7 teachers are employed. The last school enumeration gave 902 persons of school age in the town, while the enrollment was 730 and the average daily attendance 300.

Deming has a number of thriving church organizations. The First Presbyterian Church was organized in 1898. The organization bought the church and parsonage built by the Congregationalists. They worshiped in that church until 1900, when it was sold and the present church edifice erected. The church was organized with 27 members, many of them being business and other prominent people of the town. The church has ever since its organization maintained a Sunday school and young people's society.

Rev. P. L. Stanton, organizer of the Methodist Episcopal Church, came to Deming in 1883 and held services in the schoolhouse until a congregation was organized and a church built in the same year. The membership the first year was 15. At present 84 members are enrolled, 21 having been received during the past fiscal year. The congregation always maintained a Sunday school, which is now the largest in the town. A young people's society is maintained and a Spanish mission, which is doing benevolent work. The Spanish mission has 20 members.

The Roman Catholic Church has had an organization since the founding of the town. The church has grown very rapidly the past

few years and the congregation is preparing to erect a fine church building.

The Episcopal Church was one of the first in the town and has long possessed a neat house of worship. A Sunday school is maintained by the congregation.

The Baptist denomination has a missionary at Deming, who intends to organize a congregation in the near future.

Deming has gained considerable fame as a health resort, and the wonderful cures effected by its climate in cases of lung and throat troubles are bringing annually more and more health seekers. The average winter day consists of crispy, cool mornings and evenings, balmy at noon, and probably cool at night. Glorious weather to walk in, to ride in, to work in, to sleep in, to play in. There are very few days when children and invalids may not be out in perfect enjoyment. The spring and fall days are perfect, an unbroken combination of cool breezes and warm sun. The summers never know a hot night and the very air is fragrantly clear and tonic. Deming is blessed with sunshine, pure air, and pure water, a combination that gives life, routs disease, nourishes hope, warms the soul, and lifts up the heart. Year after year there are eleven clear days to one cloudy day, while in many Eastern places the sunny days are fewer than the gray days. This means clear skies, with dazzlingly bright stars not often seen in the more humid sections. The dryness of the atmosphere gives the air by day and by night a sparkle, while the little soft, cool showers generally come in summer to cool the air and make sleep refreshing and restful.

To the well the climate is an inspiration; it doubles the value of life; there is no excuse for not doing one's best. Psychologists say that more murders, suicides, and crimes of all sorts are committed on gray days, in damp, gloomy weather, than on bright days; gray weather is for despondency, discouragement, and uncharitableness, if these be in a person. To the sick the climate is a haven, a sanctuary. As in the days of old the Church was a refuge where the pursued, the weak, the helpless, could flee for safety, so Deming is a sanctuary for the sick, who sometimes shake off their pursuer, Death, and always have some respite, at least, from his pursuit. Everyone is better here; the majority of health seekers get well entirely, and even those at death's door have a pause before they must cross the dark threshold. The very air helps to destroy the germs of tuberculosis, and if the consumptive has any hope he can usually expand it into life here.

Deming's bad weather is not very bad at the worst. An occasional sand storm is mean and no one likes it, but after it is over and the sand is brushed and washed and combed out—it is to be remembered that sleet, slush, and cold, driving rains are far worse to endure, do more destruction, and are more fatal to health. There is no pneumonia, no grippe, no fever, no ague, no rheumatism in a sand storm, but it is a simon-pure aggravation.

Almost all strangers to Deming will ask: "But is it not very hot there in summer time, and are the winters warm?" Because it is so far south people who do not know the attributes of the climate expect to find the oppressive heat of the Southern lowlands. The fact is that Deming has an altitude of 4,300 feet above the level of the sea, and that this elevation modifies the temperature so that the health seeker at

Deming receives all the benefits of a Southern climate with none of its attendant ills, such as malaria. He receives also the energizing ozone of the highlands without the severity of the climate found in the mountains of the North. In a low, damp climate the damp air acts like a blanket, making the summer intolerable and the winters bitter and mercilessly cold. It is humidity that kills. In Deming the thermometer may at times range much higher in summer, but owing to the altitude and absolute clearness and dryness of the air the heat is not oppressive. In Eastern cities, and even farther North, man and beast perish from the heat every summer, but no one has ever succumbed, or ever will succumb, to the heat at Deming, even at midday in the sun. From 11 o'clock in the forenoon until 4 in the afternoon it is very warm in midsummer in the sun, but the shade is always cool and there are always little refreshing breezes. It is the lack of humidity that makes the midsummers not only tolerable, but delightful. One never swelters or stifles or gasps for breath, even on the blazing noons of the hottest July days. It is a simple scientific fact that the sun's rays do not warm the air through which they pass. The higher aeronauts go the cooler the atmosphere. The sun's heat goes through dry air as it does through a glass window without heating the glass. But when the air is damp and heavy with vapor, the sun heats the moisture and each drop becomes a little radiating mass of heat. The vapor thus heated forms a heavy upper blanket, and the earth, which also holds the heat of the sun, is below. The dweller in humid climes is therefore stifled between he two on hot days, and must often gasp and perish for breath. There being no moisture in the air at Deming, there is no upper blanket of heat to stifle the laborer when he goes about his daily toil in midsummer.

Besides tempering the heat of the sun, the dryness of the air makes the country clean and healthful. The sun, the dryness and the winds, including the much-despised sand storms, keep the country thoroughly disinfected and charge the atmosphere with electricity and ozone. Disease germs and putrefaction have short shrift. Meat may be cut and hung in the air and it will simply dry and harden, never spoil or gather to itself myriads of germs of rot and uncleanliness and disease. An animal left dead on the plains seldom becomes offensive in odor; it simply dries up without offense to the nostrils. Disease germs usually live and have their being in moisture; the dry air dries up their favorite medium and materially lessens their chance of doing harm. The sun's rays in lighting upon a moist disease germ will, in drying up the moisture, create a little peroxide of hydrogen; and peroxide of hydrogen being one of the most powerful disinfectants known to science, the germ has to die. This chemical performance, though simple, is nevertheless a great boon to the world wherever the sun shines freely. The sun is everywhere a cleaner and purifier, but in Luna County, where it shines every day and its rays strike directly, it is more so than elsewhere. Where man is careless, the sun, winds, and the dry air together do much to save him from punishment for his carelessness and help to keep this country clean and salubrious.

These advantages of climate have resulted in the selection of Deming as headquarters by the National Colony and Sanitarium for Consumptives. The society is a benevolent and philanthropic St. Louis organization, of which James R. Waddill, of St. Louis, is president; Dr. W. H. Mayfield, of the same city, is chief surgeon, and M. P. Moody

is secretary. The association is preparing to erect buildings and tents, and take care of consumptives in large numbers as quickly as the proper accommodations are provided.

Deming, with its rose gardens, its cool verandas, pretty homes, and substantial business blocks, is one of the most prosperous towns in the Southwest, and as a health resort it has no superior.

CARLSBAD.

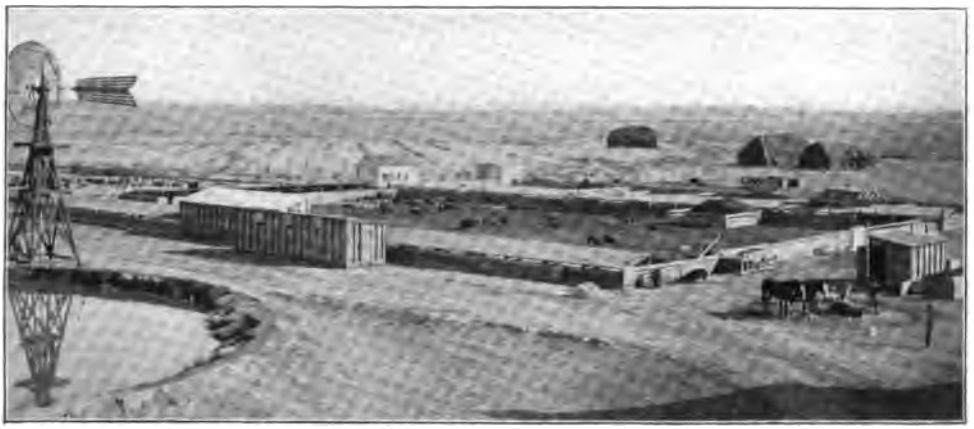
Carlsbad, the beautiful, at first named Eddy, the county seat of Eddy County, is the largest and only town of magnitude in the county. It is often declared to be the most beautiful town in New Mexico and it is certainly entrancingly situated amidst orchards and broad fields. Its ever running waters in its irrigation ditches, its 35 miles of cottonwood and other shade trees, its wide streets and beautiful homes, all help to make it a most attractive residence city. Its beautiful suburbs of La Huerta and Hagerman Heights are far famed. The Bermuda and the blue grass furnish exquisite emerald lawn settings for a floral growth as bountiful as it is beautiful. The ornamental shade trees include the catalpa, the Chinese umbrella, North Carolina and Lombardy poplar, weeping willows, Russian mulberry, while encircled hedges of gray cedar bush and the green bamboo cane are ever and anon broken by the shining spikes of the green and giant cactus palm or Spanish dagger. Here and there can be seen roses of all hues and sizes, blooming almost every month in the year; geraniums of fifteen and twenty varieties blossoming in all the soft gradations of color from pure white to the deepest crimson and royal purple; the deeper yellow and black calla lily, the far southern cousin of the tiger lily; four o'clocks of as many hues as Joseph's coat; the rare plumbago climbing vine with its purple blossoms; together with a wilderness of petunias, begonias, gladioli, and other flowers. The arboriculture of Eddy County includes the walnut, the almond, and the pecan, a flourishing grove of the latter in La Huerta growing more valuable every year.

The altitude of Carlsbad is 3,200 feet. It is 1,326 miles from Chicago, 868 miles from Kansas City, and 1,083 miles from Denver. With immediate surroundings it has a population of 2,000. Its public schools are up to date and housed in modern buildings. There are 500 children of school age in the city, and nearly all are enrolled in the public schools. There are churches of many denominations, Sunday schools, high-class social organizations, fraternal and benevolent societies, a hospital, a fine opera house, a $60,000 hotel, which is the finest hostelry in southern New Mexico; commodious business blocks, a $35,000 courthouse, excellent electric-light, telephone, water, and sewerage systems, graded and well-kept streets, and two excellent weekly newspapers—the Carlsbad Argus and the Current. The town is a modern and model American community, with beautiful environments, healthy business conditions, and a promise of a greater prosperity in the future than it has had in the past.

The necessity for increased accommodations for health seekers at Carlsbad is apparent, and a tent city should spring up in the near future. The beautiful estate called The Heights, consisting of 1,100 acres, on the east bank of the Pecos, opposite the town, and culminating in a lofty hill, was purchased by the late R. W. Tansill shortly before

THE CITY OF CARLSBAD EMBOWERED IN TREES WHERE TWENTY YEARS AGO THERE WAS A DESERT.

FRUIT GATHERING AND FRUIT PICKING IN AN IRRIGATED SAN JUAN COUNTY ORCHARD.



A STOCK RANCH IN EDDY COUNTY.

his death, with the intention of transforming it into a sanitarium. His plans will probably be realized by parties well able to carry out the project, and they are now carefully considering the proposition. Medical experts have pronounced the spot an ideal location for the purpose.

Although only fourteen years old, Carlsbad is considered one of the leading towns of New Mexico. A flattering indorsement to its stability has been given by the Atchison, Topeka and Santa Fe Railroad Company by not only giving it special freight rates upon the material to construct the great concrete aqueduct across the Pecos, but by the actual cash purchase of a large block of the bonds issued to finance the project.

FERNANDEZ DE TAOS AND RANCHOS DE TAOS.

Fernandez de Taos is the county seat of Taos County and is romantically situated in a beautiful valley surrounded by mountains, which rise abruptly from the plain. It is a very interesting town, quaintly built around a large plaza. Its Roman Catholic Church possesses considerable antiquity. Before the advent of the railroads in New Mexico it was a commercial center of great importance, and even today enjoys a good trade. Among the early American residents were Col. Kit Carson, Governor Charles Bent, who was assassinated here during the Pueblo insurrection, Col. Ceran St. Vrain, Judge Beaubien, Lucien Stewart, and others. Here the first printing press west of the Missouri was set up in 1837 by Rev. Antonio J. Martinez, and the first newspaper, El Crepusculo, was published. A good public school, mission schools, and a Loretto academy are the educational facilities of this town. A weekly newspaper, printed in English and Spanish, called Revista de Taos, is published here. Fernando de Taos has a population of 1,500.

Only 3 miles to the northeast, under the shadows of the great mountains, and occupying both sides of a clear, bright river, is the pueblo of Taos, undoubtedly the most interesting native settlement in all of the Western Continent. Scores of tourists come to visit it annually, especially on its annual feast day San Geronimo, September 30. The Jicarilla Apache Indians, the Navaho, as well the Pueblos from the south, send delegations to this festival, and the settlers for scores of miles around gather at the pueblo on that day. The population of the pueblo has been decreasing in numbers the past few decades, and numbers but few over 400 at present. The Indians cling tenaciously to their primitive customs.

Ranchos de Taos is 4 miles south of Fernandez de Taos and is the largest settlement in the county. It has two flouring mills and is surrounded by beautiful orchards. It is the center of 60,000 acres of fertile land, of which one-sixth is under cultivation. It has a public school and is the headquarters of the Presbyterian missions of this section. The population is 1,800.

Says Charles F. Lummis of the pyramids of Taos.

Far be it from me to fetch them into comparison with Ghizeh or Dahshur. They are not so ancient nor so tremendous nor so mysterious. Not a hundredth part so many inspired idiots have published careless falsehood and crazy theory about their miraculously exact orientation and their probable destiny for astronomical observatories and units of weight and measure; they are simply American pyramids, or

pyramoids, and therefore about one ten-hundredth as well known to Americans as is the sepulcher of Cheops. They are prehistoric, but still in use; they are not tombs of fabulous kings, nor impenetrable secrets of what a world has forgotten more than it ever knew; they are just monuments to human love of home and the human ingenuity of making a safe retreat even in the childhood of the race. In a word, they are the two great communal houses in which the Pueblo Indians of the northernmost valley in New Mexico have been making their simple history for probably more than 500 years.

When Francisco Vasquez de Coronado, the first North American pathfinder, was making his astounding marches through our Southwest, 350 years ago, his subordinate, Capt. Francisco de Barrionuevo, marched with a few men over 100 miles up the Rio Grande from Tiguex (a pueblo about where Bernalillo, New Mexico, now stands) and finally reached the large and powerful village of Braba, as the Indians called it; the explorers named it Valladolid, and Castaneda. The peevish chronicler of Coronado's expedition describes it so well that it has been conclusively identified with the present Taos.

To-day the Pueblo pyramid houses of Taos stand (as they did then, 69 years before there was an English-speaking resident in the New World) on the two sides of a chuckling trout brook, in a lovely valley among the last vertebræ of the Rocky Mountains. Close on the north the massive peaks spring abruptly from the little plain; to the east and south are the dwindling and farther ranges of Picuris and Santa Fe. On the west the great canyon of the Rio Grande splits the valley from the timbered uplands to the southern extremity. It is one of the finest landscapes in the Southwest; and despite its altitude of over 7,000 feet, one of the fairest valleys.

Nowhere in the world is there a more startling page of ancient history brought down to date. All of Europe has nothing which remotely suggests these human beehives, these pyramidal fortress homes of the northern Tiguas. Even among the most strangely picturesque populations of China, India, and the isles of the sea, there is no mate to Taos. It is only in America, and only in New Mexico that such things are to be seen, and they are not common even there. Zuni, the one village that is left of the Seven Cities of Cibola, whose fame led to the first discovery of Arizona, New Mexico, Indian Territory, Colorado, and Kansas by Europeans, is of the same type as Taos—bigger, but far less beautiful. And Acoma, the Sky City, and the Pueblos of Moqui are diminished specimens of the same strange development. But Taos, queen of all, the most perfect remaining type of the terraced communal house of the ancient Pueblos, which was in its turn the most astonishing domestic architecture ever invented by man, savage or civilized.

Fancy some child of the giants trying to build a pyramid of its overgrown blocks; a pyramid over 400 feet on a side, the "steps" formed by the superimposed cubes being about 10 feet high, and six layers of them laid up with childish irregularity. Fancy this vast plaything turned into a labyrinth of cells of stone and adobe, with snowy walls of gypsum, and crooked doors and earthen chimneys on each stage, and bristling ladders from step to step. Populate it with a few hundred beings of active bronze clothed in strange oriental garb, inscrutable but human, reserved but gentle, living their quaint lives with our self-same joys and sorrows, passions and hopes and fears, and with more than our balance in it all, and you begin to have a rudimentary notion of Taos.

Life and customs of this six-storied republic of two houses and 400 people are precisely like that of other Pueblo towns, which have often been described in detail.

Taos Indians are indeed of the Tiguas, the second of the six linguistic stocks of the Pueblos, their language is the same as that of Isleta—the southernmost of all the Pueblos, as Taos is the most northerly. Between them are villages speaking entirely different languages.

Like all other Pueblos, the Taos live by agriculture; and their small farms are irrigated from the mountain streams. Like all others, too, they are Catholics—brands plucked from the pagan burning by the Franciscan missionaries of whom over forty suffered martyrdom in New Mexico. Their present church is small and new—dazzled with whitewash for each yearly feast of San Geronimo, the patron saint of the Pueblo. Ruins of the old church (the first Franciscan mission in Taos, founded over two hundred and eighty years ago) stand not far off, its massive adobe walls fighting stubbornly against abuse and decay; this old church was the fort so hotly contested in the Taos rebellion, in which Governor Bent and some fifteen others were killed.

Down the valley 3 miles is the town of Taos, now the county seat; the valley is famous for its wheat and other agricultural products, and is a considerable factor in the business of the Territory, but its largest treasure is its two splendid monuments of the first American home makers and of the most original architects in history.

Another writer says of the San Geronimo festival:

Out of the brightness of a cloud he came
From Heaven descended when the earth was new
And the rocks wet; as the low sun dispended
His subtile shafts and fell the starlit dew upon the meadows.

Such is the legend of the Taos Pueblo; the tradition of Matachino, the first king of the soft-speaking tribe. It was told on the eve of the games of the annual feast of San Geronimo, in the pueblo nestling in the twilight valley of Taos midst the sounds of preparations for the games which have made the New Mexican village famous.

Long ago, when the earth was new and the rocks were wet, a great chief ruled this people. Nothing is known of him save his name and the deeds he wrought after he became king of the Pueblos, but the old men say that he came from the clouds and returned thither when he went away. This is the legend:

"One fall evening when the fitful lights of the camp fires quivered upon the trees and upon the men grouped around, and bathed in radiance the chatting women cooking the meat, a great voice was heard calling from the misty meadow. None would answer nor go out into the darkness from the cheerful village to see what it was, deeming it might be an evil spirit of the darkness. Soon the voice called each one by name and they went together and answered. Close to the turfy banks of the stream stood a man, strong and powerful. So tall was he that easily with his hand he might have brushed the soft tops of the willows he stood by, and his chest seemed broad as the quiet pools of the stream. Deep and mellow was his voice, like the mingling lowing of the herd. Sternly he demanded why the rich meadow was barren, left to the flowers and the weeds, and not bristling with corn.

"The Pueblos answered that they knew nothing of corn, nor how to grow it.

"'Then,' he said, 'I will be your king and teacher and you shall hunt your meat and you shall even find it below the earth.' And so he taught them how to grow corn and to husk and grind it, and many other useful things besides, and ruled in peace many years; but at last there came a sad day when he was summoned far away and mystery followed him.

"He called the people together and made a great feast and said at sunset he would go over the mountains alone, and none must follow him, but that surely he would return again after many years on that self-same day."

For ages the people celebrated this day with feasting and games in hopes of his return. When at last they became Catholic the priest had the games celebrated one week earlier, September 30, and called it the feast of St. Geronimo.

The good padre's explanation is different: "When a tribe is converted a church is generally built and a patron saint selected for it."

There are rites and ceremonies mixed with the religious observances which the church can not explain. There are piously tended eagles on the tops of the pueblo overlooking the broad green valley that are called the children of Matachino, and deep hidden in the mazes of that north pueblo in an estufa burns to-day and has been kept for generations a sacred hearth fire.

Strange and poetical is the festival of San Geronimo, stranger still and quaint and beautiful is the pueblo where it is held. It is a lingering of the time when the pastoral natives of the old province of Santa Fe wreathed their legends with the truths of the church. It is a glimpse of two centuries ago, a theme fit for the writer and the painter.

At vespers the evening before the saints day the festival commenced with candle offerings. As the fast setting sun suffuses the valley with tender light and the shrub-covered hills soften with rich purple and brown, the acolyte, an Indian, climbs to the flat roof of the adobe chapel and with a stone in each hand rings or beats the call to services.

After services two bands of Indians crowned with leafy chaplets and bearing green boughs in their hands file into the little adobe walled court in front of the chapel. They face each other in two long lines and then, to the music of their own weird chant, they begin to dance, moving slowly out of the yard and across the village. This is in honor of the setting sun and is called the sun dance. When the last dance is over and the hills resound with the shrill yelps of its performers the observances of the first day are concluded.

It is very beautiful in the valley of Taos; the pueblo awakes when the first wreath of smoke hangs lazily over the adobe village. Above the race course and looking down from the finish the bower of quivering aspen, which had been carried from the distant mountain, rustling all its thin gold in the morning breeze, thither the throng of people slowly moved.

Wrinkled old men and half-naked children, crowned with leafy wreaths and holding tender green sprays in their hands, clear the course, which is about 400 yards of rocky, uneven road. Willow branches thrown in the dust mark the goal. At each end of the course stand 16 runners clad only in breechcloth. All are gaily painted in red, yellow, white, and slate colors.

Two men of opposing sides start together and run to the other end of the course. As they speed along, old men clad like the heralds in Homer's time, bearing wand and willet, brush them on the shoulders with eagle feathers and shout, "Omah pah!"—try him.

As each crosses the goal a man of his side takes up the relay and runs back over the course to the start, and so on until 20 miles are run.

This race is generally supposed to decide who is to hold the offices of the pueblo for the ensuing year, but are rarely in honor of the saint and have no political significance.

In the afternoon amusement is furnished by the chiffonettes, of whom the following legend is told:

"Long ago, according to the Pueblo tradition, when the hero brothers led the people on their long pilgrimage, and their hearts were faint within them because of the hardness of the way, the sun father pitied them, and sent to gladden their hearts the delight maker, the Koshare (chiffonettes)—a man with corn leaves upon his head, who danced and sang before the people, and made them forget their weariness and sorrow. He made the corn grow and the fruit ripen, and the Koshare or their representatives exist in the pueblos to-day."

A pole 50 feet high has been set up near the two pueblos, and from its summit hang a sheep, a roll of cloth, wreaths of fruit, and a basket of bread, symbolical of the kindly fruit of the earth.

Formerly a living sheep was hung on this pole, and after suffering all day long it was thrown to the ground to be torn to pieces. But the spirit of the humane society must be abroad in the land, for the sheep is now mercifully killed some hours before it is suspended. Around the pole cluster the sacred clowns, the delight makers of the village people. They are nude, painted in black and white stripes, and wear garlands of corn husks and grain around their heads and upon their bodies. Their wit takes the form of mimicry of the occupations of the pueblo life, its threshing, sowing, hunting, harvesting, etc. Finally one clown appears hungry; he signs to one of his companions; they search for food; one sees the track of a sheep; they follow this imaginary clue for some time, making uncouth gestures; what joy! what delight! Now the sheep is espied at the top of the pole. But to reach it another half hour is consumed in pseudo-attempts to climb the pole, each failure delighting the people more and more, as the clowns slip down or fall to the earth, kicking wildly. Just as the setting sun floods all the land with the radiance one of the delight makers climbs the dizzy pole in good earnest, and with skill and celerity he detaches the fruit and bread, lastly the limp sheep, and, lowering them to his companions, slides lightly down, and the clowns disappear with their trophies. The dense crowd gradually melts away along the level valley. It is a picture of perfect peace. The distant Culebra range is purple; the golden lava caps resplendent; westward the valley stretches green and undulating to the Rio Grande del Norte. The tender luminousness of evening light seems to rest upon the fields in benediction. For the villagers have given thanks, the harvest is blessed, and San Geronimo watches over his people.

SOCORRO.

Socorro, the county seat, is also the largest town in the county. The census gives it 1,512 inhabitants, but in years gone by, when the large smelter was in operation, it had three to four times that number of inhabitants, and indications are that the day is approaching when it will again be one of the leading cities of the Territory. The country round about is rich in mineral and other resources. The water of the Rio Grande, which flows near the city, is ample to irrigate a large area, the waters of the Puerco and the Salado augmenting its volume considerably 20 to 30 miles north of Socorro. The Carthage coal fields are so near to Socorro that they may be called tributary to the city, and the mining camps of Kelly, Magdalena, and Water Canyon, and, after the construction of the Black Range Railroad, the Black Range mining districts are also tributary, making Socorro a favora-

ble smelter site. Socorro has large brickyards and three flour mills. The city is beautifully situated on a tableland at the foot of the Socorro Mountain. The Rio Grande is about 2 miles from the city. The city owns and controls its own waterworks, the supply being derived from warm springs of exceptionally pure water flowing from the base of Socorro Mountain.

Socorro has two banking institutions, one weekly newspaper—The Socorro Chieftain—two substantial school buildings, churches, and good business houses.

The New Mexico School of Mines is located at Socorro. The elevation of the city is 4,567 feet. Good sport can be had in the country round about, as the rivers, lakes, and ponds abound with wild geese and ducks, while quail and grouse are plentiful, and in the mountains larger game is found.

SAN RAFAEL.

San Rafael claims to be the most populous settlement in Valencia County, having 1,500 inhabitants. It is the center of a rich agricultural and stock section, and is located 3 miles from the Santa Fe-Pacific Railway, in the San Jose River Valley. It is near old Fort Wingate. The lands around it are irrigated by the waters of the largest spring in New Mexico, filling a ditch of clear water 6 feet wide at the top and 4 four feet wide at the bottom. Along this stream there are rich bottom lands covering 4,000 acres which produce all kinds of grain, vegetables, and fruit.

LORDSBURG.

By Don H. Kedzie.

Lordsburg is situated in Grant County, at the junction of the Southern Pacific, the Arizona and New Mexico, and the Lordsburg and Hachita railroads. It now has a population of about 1,200. The town was started when the Southern Pacific Railroad was built through southern New Mexico, and was made a division point by the railroad. It has a large roundhouse, machine shop, an extensive yard of sidetracks, coal bunkers, and two large oil tanks with a capacity of more than 2,000,000 gallons, as the Southern Pacific is using oil on most of its engines.

The passenger trains of the three roads all enter a union depot. There are many large business houses, two of which do a jobbing trade covering a large section of this country. Both the Western Union and the Postal-Telegraph Company have offices here.

The town has an electric-light and ice plant.

There are three churches, the Methodist Episcopal, the Disciples of Christ, and the Catholic, each of which has a comfortable church building. The Epworth League and Christian Endeavorers are organized here.

Secret societies have two lodges here—the Ancient Order of United Workmen and the Knights of Pythias. The latter order owns a fine castle hall, where it holds its meetings. It was the first castle hall built by this order in the Territory.

The town has a fine brick schoolhouse, all paid for, which cost $6,000. In it are ample accommodations for all the children in town. The town has a weekly newspaper, the Western Liberal, which has been

published under the same management for sixteen years, a longer time than any other paper in the Territory has been under one management.

The records in the office of the internal-revenue collector show there is at least one saloon in the town. The town is a supply point for a large section of mining and stock-raising country, and the farming country on the lower Gila. There are two star routes supplied by the Lordsburg post-office, one the Goldhill and one the Redrock.

PORTALES.

By W. E. LINDSEY.

The building of the Pecos Valley and Northeastern Railway extension, connecting Roswell, N. Mex., with Amarilla, Tex., during the fall of 1898, marked the beginning of the development of what is now known as the Inland Valley and the building of the town of Portales. While the railroad was being constructed there was a tent city on the town site which, for the most part, vanished after the tracks were laid and a depot built. Four or five sections of land in the immediate proximity to the depot were entered under the homestead law, but these entries were made for speculative purposes and by parties who soon moved to other places. Little was done in the line of settlement and the more permanent building of the town until the fall of the year 1900.

The altitude of Portales is 4,004 feet above the sea level. It is in latitude 34° 12′ N. and in longitude 103° 20′ W. from Greenwich, 90 miles from Roswell, 116 miles from Amarilla, and 18 miles from the New Mexico-Texas boundary. It lies in a valley in which rise the headwaters of the Yellow House branch of the Brazos River. The general contour of the surrounding country is level prairie, and throughout the entire vicinity water may be had from springs that flow out at several points along the draw and from a depth of 100 feet or more.

The growth of the town of Portales has been steady, and has not exceeded the settlement and development of the surrounding country. The population of the town at present is 1,200, while the precinct has a population of over 2,000. There are two banks, one national and the other Territorial. There are five hotels and a large number of boarding houses, three dry-goods stores, four hardware stores, two saddlery stores and shops, four grocery stores, three drug stores, two grain and fuel stores, two livery barns, four lumber yards, seven saloons, two meat markets, three blacksmith shops, one tin shop, two newspapers—the Portales Herald and the Portales Times—three doctors, three churches, a Masonic and a Woodmen's lodge, a plant for the manufacture of artificial stone for building purposes, a cold-storage plant, two millinery stores, six dressmaking establishments, a telephone exchange, etc. However, farming and stockraising are the industries that contribute mostly to the town's prosperity. Portales has a public school that during the past year employed three teachers. However, the schoolrooms were overcrowded, and a modern building is under construction that gives room for three more teachers. The salaries paid are such as to attract trained teachers, and the six that have been employed for the coming year make an exceptionally efficient faculty. Funds sufficient are collected to keep the schools open a term of nine months. Besides the public schools, there are

two or three private schools maintained by teachers who are specialists in kindergarten work, elocution, music, etc. Pure water free from alkali is obtained on the town site from wells at a depth of 18 feet, and an artesian well is being drilled at the present writing.

TULAROSA.

By the TULAROSA DEMOCRAT.

This little town, which is in southern New Mexico, is situated in Otero County on the El Paso and Northeastern Railway. Its latitude is about 33 degrees north and it is situated at the base of the White Mountains, whose highest peak, about 25 miles distant, rises 12,000 feet. The town itself has an altitude of 4,500 feet above the sea level. It is supplied with water by the Tularosa Creek, which is a mountain stream whose sources consist of several mountain springs, containing iron, magnesia, and sulphur, on the reservation of the Mescalero Indians, flowing for about 20 miles through the canyon dividing the White Mountains and the Sacramento ranges. These mountains are covered with pine, fir, juniper, pinon, and balsam fir, all of which endow the atmosphere with healing balm beneficial to the lungs.

To the westward are the San Andreas Mountains, some 40 miles away, showing several high peaks, and an elevation of about 9,000 feet. Northwest are the Oscura Mountains, about 40 miles distant. No finer scenery for the painter's brush can be found than is afforded from this dreamy town of Tularosa. The town is in the Tularosa Valley, a vast level plain running northerly some 60 miles, and southerly to the Texas line and beyond for 100 miles, and some 50 miles in width, a veritable paradise, if properly supplied with water, and this can be provided through storage reservoirs and pumping plants.

The temperature of Tularosa and vicinity ranges from the freezing point to 94° F. This is the record for eighteen years. The thermometer reaches its highest point about the middle of August, when for about two weeks it reaches 94° at noon, and remains there until 3 p. m., when it begins to decline, and at night the breeze sets in from the mountains which renders a blanket necessary before morning. The large number of cottonwood trees which line the streets of Tularosa furnish a dense shade, which makes the warmest days pleasant and agreeable. The real winter weather usually lasts from about the 20th of December until the 10th of January, and then ice can be seen on the irrigating ditches from one-eighth to one-fourth inch thick, but never strong enough to bear a boy's weight. Tularosa being completely landlocked against the winds on the north and east by mountain ranges and spurs from the main ranges, never experiences those sudden changes of temperature which are so severe upon those suffering from throat and lung trouble.

The first settlement at Tularosa was in 1862 by Sesario Duran, Luz Prado, Ysabel Lopez, Juan Barrio, Santos Saens, and others. The town was laid out by Sesario Duran in the year 1875. Some of the original settlers were killed by the Indians in 1864. Fruits of almost all kinds grow to perfection in Tularosa. There is no record of a failure of a fruit crop since the settlement of the town in 1862. Grapes do well, bees do well, making honey of good quality. Alfalfa grows to perfection, producing 1 to 2 tons per acre at each cutting and from three to five crops each year. Gardens are unexcelled. Toma-

toes grown here are wonders for size and flavor. Watermelons and cantaloupes raised here are unexcelled, the flavor of the cantaloupes being exceptionally fine, and the vines are very prolific.

The population in and near town is about 1,200, the census of 1900 giving Tularosa precinct a population of 752. The town has a fine public school building, the house and grounds being worth $5,000. The average attendance is about 250.

The Catholic is the oldest church in the town. There is a sprinkling of various Protestant denominations, and a union Sunday school is maintained. A union house of worship will soon be completed. There is preaching by Methodists and Baptists.

The Tularosa Democrat is the only paper published in the town and is devoted to general news and to the mining and agricultural and horticultural interests of Otero County and of New Mexico.

Each and every lot in town is a corner lot and has a water right, and is large enough for garden and orchard purposes, containing nearly one-half acre each. The town is covered with the finest shade trees, the thriftiest orchards, and the best gardens to be found in New Mexico or elsewhere.

There are nine grocery and dry-goods stores in the place, one drug store, two saloons, two blacksmith shops, one hotel, one doctor, a justice of the peace, a constable, and two notaries.

The tourist and hunter will find many attractions in the vicinity of Tularosa. The mountain landscape and wonderful "mirage of the desert" to be often seen in the Tularosa Valley are things worth going miles to see. Six hours' ride will take the hunter among the wild turkey, blacktail deer, and cinnamon bear, and a day's drive in a buggy will carry the disciple of Walton to where the speckled trout are waiting, greedy for the angler's bait.

A large area of public lands is still vacant in the vicinity of Tularosa. That they are rich and fertile is proved fully by the lands under cultivation in this section. But irrigation is necessary. Turn water on the land and it will produce anything grown in the Temperate Zone, and many of the products of the Tropics. The mountain streams furnish water only in limited quantity during the dry seasons, but enough goes to waste and is lost during the winter months to irrigate a country as large as a New England State, if it were only stored in reservoirs, where nature has almost provided them—the mountain canyons. A movement is now on foot to effect that object. The mountain ranges near Tularosa contain large deposits of gold, silver, copper, iron, and coal yet undeveloped.

To those seeking for health we say come and breathe the dry mountain air of Tularosa, charged with the life-giving ozone and warmed by a southern sun. Come and eat the fine-flavored fruits of the soil.

To the tourist and pleasure seeker we say, come and hunt the deer, the bear, and wild turkey, and fish in the mountain waters.

To the capitalist we say, come and examine the greatest opportunities for irrigation enterprises which the country affords. As a mineral and mining country this section is coming to the front, and mining men are coming here almost daily to examine and report on mining propositions. It will only be a short time until the facilities for shipping ore will be good, and claims that have not been worked heretofore will be good properties. And to the homeless one who may desire to avail himself of the United States land laws, we say that in

the vicinity of Tularosa lies the largest body of unappropriated public land now left out of the once almost boundless American public domain.

A company has been organized to dam the Rinconada Canyon. If this is done 20,000 more acres in the vicinity of Tularosa will be placed under irrigation.

BELEN.

By CARL A. DALIES.

Belen is situated 30 miles south of Albuquerque, almost the exact geographical center of Valencia County, on the west banks of the Rio Grande River. It has an altitude of 4,500 feet. Its population is somewhat over 1,200 souls, a public-spirited class of people, alive with energy, thrift, and ambition. The town is unsurpassed as to climate, location, and soil. The stretch of country in the center of which the town is located can not be excelled for fertility and productiveness, Belen having an enviable reputation of being the center of a rich agricultural and sheep-raising district.

Belen stands above all other communities in New Mexico in that it has—

The largest retail merchandise establishment; the largest flour mill; it is the largest railroad shipping point in proportion to population; it raises the best grapes; it holds the first prize of the Word's Columbian Exposition at Chicago for wheat in competition with the world.

Belen has seven well-established general merchandise stores; two general wholesale establishments; one wholesale liquor house; one roller mill; several hotels, saloons, restaurants, barber shops, blacksmith shops; jewelry stores, a business men's association, etc.; one weekly newspaper, the New Mexico American, is to be established in the near future; two physicians and lawyers. The First National Bank of Belen is a new institution and promises to grow apace, since it is backed by several of the most substantial men in the Territory. The Catholics as well as the Protestants have each a comfortable and commodious church edifice. In front of the Catholic Church stands one of the most artistie architectural monuments in the Southwest, the Felipe Chavez Mausoleum, built at a cost of $15,000 by Hon. Felipe Chavez, to be the last resting place of his lamented wife.

The school facilities of Belen are very good, there being three schools, the Felipe Chavez Girls' Academy, the Becker School, and the public school. Hon. Filipe Chavez maintains at his expense an academy for a term of eight months every year to give a liberal education to children who would otherwise be deprived of this boon.

The curriculum includes domestic science and duties. The attendance at the three schools is in the neighborhood of 300. Great attention is given to the selection of instructors, and the teachers are therefore persons of high scholarly attainments and qualifications. Strides are being made toward an even higher level, and Belen will soon be able to boast of school facilities of which many a larger town might be proud.

The railroad facilities of Belen are excelled by few cities in New Mexico. It has the Atchison, Topeka and Santa Fe Railway connecting the city with the extreme northern and southern portions of the Territory and the country that lies between. The Eastern Railway of New Mexico, now under construction, gives direct connection with

the Santa Fe Central Railway, the Chicago, Rock Island and Pacific Railway, and the proposed Albuquerque and Eastern Railway to the east, while to the west connection is given with the Santa Fe and Pacific. All signs point to a continued and substantial growth in population and wealth brought about by the advent of the new Continental Railroad through the town. The new railroad, together with the natural site for a large city, the solid agricultural basis and location adapted for a trade center, as well as the varied natural advantages and attractions, will within a few years bring Belen into the front rank of New Mexico's cities. Already it is showing signs of considerable growth, and as it has been assured that the railroad interests intend to invest heavily in Belen in the shape of shops, roundhouse, etc., it will be but a matter of a few months more when the present population will be doubled, and after that an uninterrupted, solid growth will follow.

SANTA ROSA.

By F. L. BRAUN.

Santa Rosa, the county seat, consists of an old town and a new town, the latter being laid out by the Alamogordo Improvement Company since the advent of the Rock Island. Five hundred acres are embraced in the Santa Rosa town site, which is picturesquely situated on the Pecos River. This is platted around a plaza, one side of the plaza being reserved for the erection of a modern and model hotel. The handsome Rock Island passenger depot faces the plaza, while the commodious freight depot is close at hand. Santa Rosa is a prosperous and growing railroad, trade, and stock center, with a population of 1,200. It has two weekly newspapers, the Santa Rosa Star and the La Voz Publica, a bank, several churches, the Roman Catholic Church, Baptist, and Methodist denominations being represented, a good school employing three teachers and having a nine months' term, railroad shops and roundhouses. The town is on the Pecos River. The new town is situated at an elevation of 4,600 feet. The surrounding country, with the exception of the valleys along the river, is prairie and devoted exclusively to cattle and sheep raising. Along the valley splendid fruit, grain, and vegetables can be grown with the aid of irrigation. The water in the Pecos River from the Santa Rosa crossing south is alkali, while 100 yards above the crossing it is fairly good. The alkaline character of the water below is caused by gypsum and alkali springs flowing into the river. The people at the town either haul their water or have cisterns and catch rain water for all domestic purposes, but a company has been organized to bring water into the town, to put in electric light and telephone.

One remarkable example of the well and windmill method of irrigation now exists in this county. It is the Sumner ranch, 8 miles north of Santa Rosa. When one rounds the point of a barren range of rocky hills and gets a glimpse of this fertile farm, one is tempted to believe that a portion of the rich agricultural section of Iowa has been transported to this sandy plain. The owners of the Sumner ranch are pioneers, and their success is likely to be followed up by many newcomers. With a tributary farming territory, such as seems likely to spring up within the next few years, Santa Rosa would be prosperous if all other resources were removed. It is the division headquarters of the Rock Island and El Paso Railroad. It is here also that the El

Paso and Rock Island division starts. New Mexico is watching with deep interest the sinking of a drill hole for oil 6 miles northwest of Santa Rosa, and on the borders of the Perea grant, by the Consolidated Oil and Fuel Company of New Mexico, representing in its operations six other companies, composed almost exclusively of New Mexico capital, and holding claims nearly surrounding the Perea tract, these claims amounting in round numbers to 7,000 acres.

Every acre of ground for 5 miles around the well—one might say with safety for 10 miles around—is staked out by people who are holding their claims awaiting developments at the solitary derrick which may prove of such vast importance to the Territory. Santa Rosa is sheltered by hills on every side. It has but few of the winds and storms so likely to spring up at any time in the less protected uplands which make up the greater part of the county. The country around is not without its scenic attractions, and the climate is quite equal to that of any other portion of northern and eastern New Mexico. Santa Rosa sandstone quarries are already of wide name and fame, and half a dozen contracts have been let for the erection of business blocks to be constructed from this local stone. In addition to its profuse local use the superb sandstone, including solid red, white, and gray colors and variegated hues, will develop a shipping industry of wide radius and profitable returns.

CAPITAN.

By the CAPITAN PROGRESS.

Nestling in a spot surrounded on every side by rugged hills which rise on one side into the majestic Capitans and terminate on the other in the snow-capped Sierra Blanca—the Pikes Peak of New Mexico—the town of Capitan and its sister town of North Capitan are slowly but surely emerging from a village into a city. A more picturesque spot for a town could not have been found had the whole world been searched over. These rugged hills rising in broken line to meet the blue arch of heaven furnish ever-changing scenery for the eye, as every glance reveals some new beauty in them. The ethereal blueness of the sky and the verdant green of the hills in summer, or the brown and sere of winter, form a contrast of colors more beautiful than ever portrayed on canvas. The huge rocks clinging to the near-by hills, placed there by some mighty force, and the distant mountain peaks towering high into the clouds, serve as a continuous reminder of the countless ages that nature required in accomplishing the works of the Deity. Although nature had been lavish in her decorations, the presence of man was needed to complete the scene, and the town of Capitan sprang into existence. In a very short time a wonderful transformation had taken place. The howl of the coyote and the screech of the owl gave place to the hum of business and the whistle of engines, which are kept busy day and night bringing to the surface coal dug by hundreds of miners.

Where a little over two years ago stood one house and a small store, to-day we see a town of nearly a thousand people, with business blocks, comfortable residences, and everything that goes to make up a busy town. Since the opening of the town on the 3d day of March, 1899, Capitan has had a marvelously rapid growth when it is considered that it has grown to its present size entirely upon its own merits. The

census of 1900 gave the precinct in which Capitan is located a population of 670; to-day Capitan and North Capitan, the latter being the coal-mining town, have a population of 1,200. Of course, there are a great many towns that have attained a much larger size in the same length of time, but such results have only been accomplished in towns where companies have operated to start a boom, and which often sooner or later results disastrously to those who put their money into the town. Capitan is in no sense of the word a boom town, as it draws its support from a large section of country rich in natural resources and advantages and does not have to depend upon the success or failure of any one enterprise, thus rendering the town a safe place to engage in business. As it derives its main support from the surrounding country, its prosperity is of a substantial nature and is not the result of any unnatural conditions which, when removed, would leave the town suspended in the air, as it were, without anything to assure its future growth. Such being the case, those who invest their money in the town can do so with a full sense of security in the knowledge that every day, every month, and every year their property is increasing in value as the country develops, giving the town additional stability.

It is true that Capitan is the location of the New Mexico Fuel Company's coal mines, where several hundred men are employed, and which has a pay roll of nearly $10,000 a month, yet it has so many resources to rest secure in that this pay roll, while large in itself, is but a small factor in the support of the town. The fertile valleys of the surrounding country produce their enormous crops of fruit, grain, and vegetables, the hills keep their thousands of head of cattle sleek and fat the year round, while the mountains contain fabulous riches in the way of immense deposits of gold, silver, lead, copper, and all kinds of mineral wealth, which are just beginning to yield up their treasure. These and other industries which have stood the test for years in Lincoln County are the foundation of Capitan's marvelous and rapid strides toward commercial importance.

From what has been said it can be readily seen that Capitan offers unexcelled opportunities to those who prefer a steady, substantial growth in a town to a town which attains full growth in a day and disappears in a night, and who are satisfied with material progress rather than imaginary prosperity.

Capitan is situated practically in the geographical center of Lincoln County and can be reached by a direct route from all parts of the county. Being thus favorably located, it is the supply point for the surrounding towns, the headquarters for all the large mining companies operating in this section, and the trading point for the farmers and stockmen for miles around.

It is also an important railroad point, being the terminus of the Capitan branch of the El Paso and Northeastern Railway, and freighting point for an immense territory. While being a terminal, it may at the same time be considered as being on the main line of the El Paso-Rock Island road, as it is only 20 miles from Carizozo Junction. Being thus practically on the main line of this great trunk line, and the terminus of an independent branch, it has the twofold advantage of being in direct communication with eastern points and possessing an individuality not to be found in towns along the direct route.

In order to appreciate properly the importance of the place one has

but to remain in town for a day or so to see the wagons being loaded with goods for the various parts of the country and the immense quantities of produce which find a ready market with the local merchants. Wagon after wagon loaded with hay, grain, wool, hides, etc., may be seen coming into town daily, which return loaded with supplies for Fort Stanton, Lincoln, Bonito, Ruidoso, Picacho, Hondo, or some of the other outside trading points of the county. Within the last few months the volume of business transacted here has more than doubled, which shows how rapidly the county is developing.

Capitan, while progressing so rapidly along commercial lines, has not neglected to keep fully abreast of the times in educational matters. No sooner had the town been established than steps were taken to make this the educational center of the county, as it was realized that there is nothing so essential to the growth of a town as good schools. Acting upon this well-established principle, the district was platted and bonds to the extent of $12,000 were voted to raise funds to erect a suitable school building. The bonds were placed upon the market, found ready buyers at a good premium, and as a result Capitan to-day has one of the finest public school buildings in the Territory.

The present public school facilities of Capitan are not surpassed by those of any other town in the Territory. The district being large, there is always sufficient funds for at least a nine months' school. The very best teachers that can be obtained are secured to conduct the school, and no pains are spared to keep the efficiency of the school up to a high standard.

Capitan has several churches and a weekly newspaper, the Capitan News. It is but a few miles from the famous marine sanitarium for consumptives at Fort Stanton, and private capital is considering the erection of a large sanitarium at Capitan, for which it would be an ideal site.

TIERRA AMARILLA AND PARK VIEW.

Tierra Amarilla is the county seat of Rio Arriba County, and is situated in the beautiful Chama Valley, with pretty agricultural settlements all around it, the principal of which is Park View. The population of Tierra Amarilla and contiguous settlements, including the charming village of Park View, is about 2,200. Tierra Amarilla and Park View boast of several fine business houses and are also the center of a wealthy stock region.

SAN MARCIAL.

By H. H. Howard.

San Marcial, the second largest town in Socorro County, is an attractive and important little city—attractive for the reason that twenty-one years ago the Atchison, Topeka and Santa Fe Railway Company planted great avenues of cottonwood trees, and these have been constantly added to by the citizens, until now the town is known far and wide for the beauty and coolness of its groves. The place is an important commercial center for the reason that it is the supply point for a large area of country. Four large merchandising firms draw their trade from a wide territory occupied by people extensively engaged in the cattle and sheep business, and the neighboring towns

of Clyde, Rosedale, Paraje, Engle, and Chloride draw upon the San Marcial merchants largely for supplies. The population of the town is a little above the 1,000 mark, about one-third of this number being made up of a very industrious class of natives, who cultivate small farms and work for the railway company in various capacities.

The town has a beautiful park in which are located a band stand and a fountain. It is the divisional headquarters of the railway company, and here are located a roundhouse and repair shops. Quite a large number of men (skilled and unskilled) are given employment at good wages. A modern flouring mill is conducted for the convenience of a large number of farmers in the rich Rio Grande Valley. Beautiful orchards surround the city, which is the center of a rich agricultural, horticultural, live-stock, and mining region. Alfalfa is extensively grown, and when there is an ample supply of water, which is taken from the Rio Grande River through ditches, four crops in one season are of common occurrence. This finds a ready local market, the price per ton ranging from $10 to $14.

San Marcial has a large public school building. Four religious denominations—the Roman Catholics, Episcopalians, Methodists, and Free Methodists—have church edifices. The town has a good weekly newspaper, the San Marcial Bee. Next September a new educational institution is to throw open its doors. It is called the Holiness and Missionary Institute. The object of the work is to spread Bible holiness over the Southwest; to found a place where the teaching of religion will have an equal opportunity with secular books. A large two-story frame building in the heart of the town has been donated for the work, which is to be maintained by contributions.

The fraternal orders are represented by the Masons, Odd Fellows, Knights of Pythias, Woodmen of the World, Ancient Order of United Workmen, and all the various railroad orders have flourishing local lodges.

The town has a number of handsome residences, a new opera house, bank, and good hotels. It is directly on the line of the Atchison, Topeka and Santa Fe Railroad, making quick and easy communication with all parts of the country possible. Located near the center of the Territory, at an elevation of a little over 4,000 feet, the climate makes it a sanitarium for those afflicted with pulmonary diseases. Here are to be found all the conditions for a healthy and happy life, with the opportunity to realize the maximum of profit in the lines of horticulture and agriculture. From here there is a mail route to Clyde, 3 miles distant; one to the Rosedale mining camp, 30 miles distant, and another is about to be established to the famed Jornado del Muerto region, 35 miles distant.

The valuable stretch of level land with rich soil which extends along the west bank of the Rio Grande River and extends to the detached ranges of the mountains which mark its eastern limit is attracting considerable attention and seems likely to lose its ill-starred appellation of "del muerto" and become one of the most fruitful spots in the Territory. No agriculturist looks upon its undulating surface and examines its rich soil without longing for water to convert the dead plain into a source of life. Several enterprises are under way to reclaim this extensive and valuable tract.

San Marcial is not devoid of historical interest. One of the features of the town is a large and extensive promontory known as the mesa.

Here occurred the battle of Valverde, fought February 20, 1862, by General Sibley's Texans and the Union forces under General Canby, then commander at Fort Craig. The severest part of the battle occurred about the present site of San Marcial. Frequently cannon balls and other relics are plowed up on the east side of the river. Sibley's was a heroic band, but the few regulars and the loyal native militia proved too much for them, and only a remnant of his brigade, ragged and footsore, ever reached their homes.

TUCUMCARI.

By E. G. Cooper.

Tucumcari is a beautiful little town located at the foot of Tucumcari Mountain, at the junction of the Chicago, Rock Island and Pacific Railway and the Choctaw-Amarillo extension, at present under construction. It shares, therefore, with Santa Fe, Deming, and Lordsburg the distinction of being the only towns in New Mexico with three railways.

The surrounding country is a rolling prairie, broken and intercepted by numerous small streams and the Canadian River, which flows through the eastern portion of Quay County, of which Tucumcari is the county seat. The rich grazing lands of Quay County are dotted with thousands of head of fine cattle and sheep, with here and there comfortable ranch homes located in desirable spots. The surrounding country is settling up rapidly; trees are being planted and crops this year are in splendid condition.

Tucumcari has a population of 1,000. The town is but eighteen months old and is making a rapid growth. A number of large new buildings have just been completed. Among them are the First National Bank, built at a cost of $15,000; the M. B. Goldenberg store, cost $8,000; the Harrison Hotel, cost $4,000. Gross & Richards also have a large mercantile establishment and do an enormous business.

The board of county commissioners has just let the contract for a $15,000 court-house and jail. The contract has also been let for a $10,000 school building that will be completed in October. The three railroads which form a junction at Tucumcari have completed plans for a $15,000 union depot, shops, and a large roundhouse. Many other smaller buildings, including cozy homes, are in the course of construction. Tucumcari has two newspapers, The Times and The Democrat. At present there is but one church organization, the Methodist Episcopal, but the Roman Catholics and others are planning organization. A number of fraternal societies have been organized.

LOS LUNAS.

Los Lunas is the county seat of Valencia County, and is situated on the west bank of the Rio Grande, 21 miles south of Albuquerque.

The population is 1,000. It has a two-story court-house and a large Catholic church. There is a substantial wagon bridge across the Rio Grande opposite the town. There are two large general stores, a hotel, two blacksmith shops, two attorneys, and one physician. Los Lunas is a prosperous shipping point, especially of wool and alfalfa. A rich agricultural and stock region surrounds it. The town is connected by telephone with Albuquerque.

WAGONMOUND.

By H. B. Baca.

The town of Wagonmound is the largest settlement in Mora County, the census of 1900 giving Wagonmound precinct a population of 895, while the population of the town itself is 500. Its elevation is 6,250 feet above the sea level, and it enjoys a delightful climate both summer and winter and offers a good site for health and pleasure resorts, the mountain peaks round about making its surroundings especially picturesque. The principal occupation of the inhabitants of Wagonmound precinct is stock raising and merchandising. Wagonmound is a law-abiding community, with excellent public schools, which are housed in a modern four-roomed $5,000 building, the teachers being selected upon merit alone. The enrollment of pupils is 250, many children from outside the town attending the schools. A movement is on foot to incorporate Wagonmound in the near future.

There are two large mercantile houses doing an extensive business, two grocery stores, a bookstore, three bakeries, one butchershop, two blacksmith shops, two modern hotels, two restaurants, two fruit and vegetable dealers, and two dairies. A weekly newspaper, El Combate, Spanish and English, is printed in the town, which also boasts of two churches. There are four saloons and a livery barn.

Wagonmound is situated on the main line of the Atchison, Topeka and Santa Fe Railway, and owing to its climatic advantages and beauty of surroundings is attracting quite a number of health seekers. There are four daily mails, besides a triweekly mail and stage, to surrounding settlements. It is a great wool and stock shipping point and the trading center for the Ocate and Mora valleys. The railroad company has a large sheep-dipping plant at Wagonmound. Several beautiful farms are in the immediate vicinity and offer accommodations to health seekers.

WHITEOAKS.

By Lee Rudisille.

The best-known town of Lincoln County is Whiteoaks, with a population, according to the census, of 804. It was located in 1880, and its fame rests upon its gold mines, principally the Old Abe and North and South Homestake. It is 6 miles from the El Paso and Rock Island Railway and 12 miles from Carizozo on the El Paso and Northeastern Railway, from where, once a day, a stagecoach runs to Whiteoaks. The town has three churches—Congregational, Methodist Episcopal, and Baptist—and a $10,000 schoolhouse, with an excellent school system. It also has a Masonic and an Odd Fellows lodge, a G. A. R. post, and flourishing lodges of Knights of Pythias and American Order of United Workmen. Whiteoaks is 6,400 feet above the sea level. There are two hotels, a planing mill, and one saloon in the town. Excellent water is secured from near-by springs.

Whiteoaks is located in a beautiful valley or natural amphitheater in the Whiteoaks range of mountains, surrounded on all sides by high peaks covered with the evergreen pine, cedar, and juniper. While several large cattle, sheep, and goat ranches are located in the immediate vicinity of Whiteoaks, from which it derives an extensive and profitable trade, the principal sources of the town's business—those

which induced the establishment of the town at this point—are the mining operations. Something more than twenty-two years ago quartz veins, carrying visible gold in surprisingly large quantities, were discovered in what are now known as the North and South Homestake mines, and out of these discoveries and the "boom" created thereby grew the necessity for a trade center, and Whiteoaks was the result. It is inhabited by an enterprising class of citizens, who believe in good schools, churches, and respectable society.

The business houses would be creditable anywhere to a town of 1,000 or 2,000 people. No place can boast of a more ideal climate than this. The winters are mild, though light snowfalls are experienced at times; the streets are free from dust except at short periods and at rare intervals, while the summers and autumns are charming, a few weeks during the spring months being the only period of the year when this locality has any climatic drawback. This is due to the dust and windstorms so common in the arid portions of the country. The nights here are always cool, and in the hottest season one, under a canopy or in the shade, never suffers from the heat. In fact, it is the universal assertion of those who have lived here for years that this is the most perfect all-around climate they have ever found. Some of the business men of the town now have a plan on foot to establish a large sanitarium at Whiteoaks, as no point in the Southwest can offer greater advantages to the health seeker.

BERNALILLO.

Bernalillo is the largest town of the new county of Sandoval. It was at one time the county seat of the county of Bernalillo, in which it was located formerly. It has quite an interesting history and is one of the oldest European settlements in the Rio Grande Valley. It is picturesquely situated, surrounded by fields and orchards, which are irrigated from the Rio Grande River. Bernalillo has a modern flour mill, several substantial business houses, an academy for girls, good public schools, many beautiful homes, and its climate makes it a very desirable place for health seekers. Round about it are many prosperous agricultural settlements. Several Indian pueblos lie a few miles north of it. The vineyards of the immediate vicinity of Bernalillo are especially famous, the Mission grape here attaining a size and flavor that is unexcelled. There is a Roman Catholic church at Bernalillo. The town is situated on the main line of the Atchison, Topeka and Santa Fe Railway. The census of 1900 gave Bernalillo a population of 766, but as many more people live in the immediate vicinity of the town.

HAGERMAN.

The town of Hagerman, laid out in 1893 by the Pecos Valley Town Company, in Chaves County, was fittingly named in honor of J. J. Hagerman, of Colorado Springs, president of many of the companies operating in the Pecos Valley. It is situated about 24 miles southeast of Roswell, and is surrounded by thousands of acres of the choicest agricultural, fruit, and grazing land in the country. It has a population of about 800, and the intelligence, thrift, and morals of its people are plentifully attested by fine brick business houses, attractive and commodious homes, excellent schools and churches, careful observance

of approved sanitary principles, and a general air of neatness and good order.

The town and country adjacent have been settled by progressive and energetic people, chiefly from Illinois, Iowa, Nebraska, and Kansas, and their wisely directed efforts have already transformed the barren waste of ten years ago into a veritable garden spot that blooms and blossoms like the rose. The magic touch of water and careful cultivation have achieved wonders here, and the miracle workers have only just begun operations. The magnificent irrigation system constructed by the Pecos Irrigation and Improvement Company extends from a point 4½ miles due east of Roswell 30 miles south and irrigates the fine body of land tributary to the town of Hagerman. The water supply thus afforded has been immensely increased by the development of artesian water in many places.

Many small farms are plentifully watered from these never-failing wells, and much of the supply in the canals is conserved for use on large tracts farther down the valley. The value of these wells will be understood by readers unfamiliar with the facts when it is explained that a well flowing 100 gallons a minute, if none were lost by seepage or evaporation, would cover 78½ acres to a depth of 24 inches in a year. Allowing one-half for loss by evaporation in reservoirs and ditches, a 400-gallon well will then furnish 24 inches for a quarter section during the year. Considering that 20 inches of rainfall is sufficient for a crop, even when much of it comes out of season and often in injurious excess, it will be readily understood that 24 inches stored in reservoirs and applied only when needed is ample. This is not theory. It has been clearly demonstrated in actual practice at both Roswell and Hagerman.

PERALTA.

The fourth town in importance in Valencia County is Peralta, the scene of a bloody battle during the civil war. It is situated in the valley of the Rio Grande opposite Los Lunas and has 800 inhabitants. It is connected by long-distance telephone with Albuquerque, 20 miles north. The town has a fine flour mill, five general merchandise stores, one blacksmith shop, two attorneys, one Methodist minister, and one physician. There is one Roman Catholic Church and one Methodist Church building.

CLAYTON.

The county seat of Union County is Clayton, situated in the northeastern part of the county on the Colorado and Southern Railway. Here the Federal land office for the northeastern part of New Mexico is situated. The town has a population of 800. It has electric lights and waterworks, a telephone system, a splendid public school system, and a fine public school building, a Methodist, Baptist, and Christian church, a number of secret societies, many business establishments, and contains many nice homes. From here 3,000,000 pounds of wool, 160 carloads of cattle, and 400 carloads of sheep and lambs are shipped annually. There is a first-class hotel in the town. A $20,000 courthouse was recently completed. One weekly newspaper in Spanish, El Fenix, is published in the town. The town has a prosperous national bank, and of late years is attracting quite a number of health seekers. Coal deposits are being worked in a small way near Clayton.

FOLSOM.

Folsom is the second largest town of Union County, having a population of 750. It is situated on the Colorado and Southern Railway. It is gaining fame as a health resort. It is 6,400 feet above sea level, and is located in a beautiful valley. The Sierra Grande, 12 miles distant, rises to an altitude of 11,500 feet. During the summer months this mountain is one mass of flowers, and is a magnificent sight. Sierra Capulin, 5 miles from the town, is 9,500 feet high, and is an extinct volcano with a perfect crater. The view from Mount Capulin is grand. Nine miles from Folsom, on the Colorado and Southern Railway, are the so-called American Alps. Emerys Peak and Buffalo Head are also visible from Folsom. Twin Mountains, Robinsons Peak, Red Mountain, and Dales Peak are landmarks, while in the distance Pikes Peak and the Spanish Peaks can be seen on clear days, and 330 days each year are clear at Folsom. The Cimarron Falls—near the Hotel Capulin, a sanitarium built at a cost of $75,000, but not completed—are a beautiful sight. Numerous springs bubble forth from the sides of the mountains inclosing the valley of the Cimarron in which Folsom is situated. The water of some of the springs is almost absolutely pure, while others are charged with minerals, and cure persons suffering from gout, rheumatism, neuralgia, stomach troubles, and certain forms of kidney disease. Several sulphur springs and sulphur wells near Folsom are wonderfully beneficial to persons suffering from skin diseases and impure blood. The most celebrated spring is in Oak Canyon, near the town, the waters of which are superior to those of the famous iron spring at Manitou, Colo. These waters contain iron, sulphur, magnesia, and carbonic acid gas. Folsom is an important trade center. Immense sheep-dipping tanks have been erected here by the Colorado and Southern Railway, and the shipments of wool, sheep, lambs, and cattle from this point annually are very large. Folsom has an $8,000 public schoolhouse, a $7,000 hotel in addition to the Hotel Capulin, which is soon to be completed, and promises to become one of the most famous sanitariums in the West. Water is found anywhere in the Cimarron Valley from a depth of 14 to 30 feet, and is free from alkali. Indications of gold, silver, copper, lead, and coal are found near the town. Lime quarries are located near, and the product is being utilized in the manufacture of plaster. A Union Protestant and a Catholic congregation have been established in the town.

One newspaper, a Spanish weekly, El Independiente, is published here.

FARMINGTON.

By GRANVILLE PENDLETON.

Farmington is the oldest and largest town in San Juan County, having a population of about 750. It is situated on the San Juan River, between the mouths of the Animas and La Plata rivers. It was an Indian trading post twenty-five years ago, and was for some years the county seat. Every branch of trade is represented. There are three large mercantile establishments, two hotels, two restaurants, one drug store, one millinery store, one hardware store, one confectionery store, two blacksmith shops, a modern flouring mill run by water power, a distillery, an evaporator, two meat markets and a meat-packing estab-

lishment, one lumber yard, one jewelry store, two barber shops, three churches (the Methodist, Presbyterian, and Baptist), one weekly newspaper (the Farmington Times-Hustler), two saloons, one bank, two physicians, two lawyers, three real estate agents, one livery stable, one brick yard, three carpenters and builders, two contractors, two brick and stone masons. Farmington is an incorporated town, has a system of public water works and an electric-light plant. It has a commodious brick school building, a Masonic lodge with Eastern Star connection, the Odd Fellows with Rebekahs, Maccabees, Woodmen, and Workmen. Much of the growth and prosperity of Farmington in the past two years has been due to the investments and enterprises of the Hyde exploration expedition, which has built modern, up-to-date brick buildings, and invested extensive capital in a number of local enterprises. The company established a large wholesale mercantile store, a meat-packing plant, a Navaho blanket and Indian curio store, and handles live stock of all kinds, grain, hay, provisions, the products of the evaporator and the distillery, and will establish a bank in connection with its stores at Farmington and at Aztec. The company lately incorporated under the name of "The San Juan Stores," with Joseph Prewitt as manager and Monroe Fields and R. R. Buck as the other members of the firm.

A large Government school for the Navaho is to be built 10 miles west of Farmington.

CERRILLOS.

Cerrillos is an incorporated town situated in southern Santa Fe County on the main line of the Atchison, Topeka, and Santa Fe Railway. It is the commercial center of the coal fields at Madrid, O'Mara, and vicinity, and is surrounded by gold, silver, lead, and other mines and prospects, being near the oldest gold-mining district in the United States. The town has a smelter which treats ore from Socorro County, especially the Magdalena district, as well as from the mining districts near Cerrillos. Excellent building stone is quarried near the town. The Galisteo River flows near to the town, and good water is obtained from wells at no great depth. The town has a hotel, restaurants, boarding houses, and several prosperous business houses. The school system is especially good, and the town has a fine school building. The census of 1900 credited the town with 673 inhabitants, and, with surroundings, it has a population of 1,000.

MORA.

Mora is the county seat of Mora County, and was first settled in 1832. It is situated in one of the prettiest valleys of the United States; is surrounded by mountains on all sides except where the valley runs southward to Rociada and to San Miguel County. The Mora River supplies the valley with an abundance of water and furnishes power for three grist mills. The town has good roads, connecting it with outside points, and is connected by telephone with Las Vegas. There are four general stores, carrying large stocks of goods; two hotels, with good accommodations; three blacksmith shops; two physicians, and several saloons. Mora also has a nice court-house, one Roman Catholic Church, one Protestant church, a Catholic convent conducted by the Sisters of Loretto, who also maintain an excellent school, a

public school, and quite a number of pretty homes. The population of the settlement is about 700. It is a pleasant summer resort, and many fishing parties from Las Vegas and other points go there to fish for trout. The Rio de la Casa, which comes tumbling from the mountains, contains the speckled beauties. Promising mineral prospects are in the mountains near by, and health seekers often go to Mora for rest and health. All that Mora needs to become a large and prosperous town is railroad connection with the outside world.

AZTEC.

By GRANVILLE PENDLETON.

Aztec, on the Animas, is the county seat of San Juan County, permanently located by a vote of the people, near the center of the voting and business population of the county. From north to south it is about 36 miles from the Colorado State line to Farmington, which marks the southern line of settlement. Aztec being 16 miles south of the State line and 20 miles north of Farmington, is thus near the middle from north to south. It is about 20 miles from Largo and 20 miles from the western limit of settlement, and thus in the center of settlement in that direction. It is about 35 miles from Aztec northeast to the Pine River settlement and about as far to Jewett, the settlement nearest to the Navaho Reservation, which lies in the western part of the county. Aztec is only ten years old, yet it has representatives of nearly every branch of business and trade. It has 4 general mercantile stores, 1 hotel, 1 restaurant, 1 drug store, 1 hardware store, a modern water-power flour mill, 1 barber shop, 1 livery stable, 1 harness shop, 2 saloons, 1 lawyer, 2 physicians, 3 ministers, 1 millinery store, 1 jewelry store, 3 carpenters, 2 plasterers, 2 stone and brick masons, 1 confectionery store, 1 nursery, 3 churches (Baptist, Methodist, and Presbyterian), a new $10,000 court-house and jail, a high school building, whose four rooms, however, have been outgrown by the town, and another schoolhouse will be built to increase the school facilities. Aztec has a Masonic lodge with Eastern Star in connection, an Odd Fellows' lodge with Rebekah lodge in connection, also Maccabees, with quite a number of Woodmen and Red Men, who are about to organize lodges. The Masonic fraternity has a beautifully furnished lodge room and the Odd Fellows have constructed a two-story brick building with a large hall. The lodge has a membership of 55. Both the Baptists and Methodists have Sunday schools in connection with their congregations and hold services every Sunday morning and evening. A banking institution is about to be established. The population of Aztec is about 600.

SPRINGER.

Springer, the county seat of Colfax County, before the honor was bestowed upon Raton, is second in importance, although only fifth in population in the county, the census crediting it with 558 people. But Springer is growing since the completion of the Dawson Railway, which passes near the town. It is the center of a fine stock and agricultural section and has oil and coal indications near to it. Cement rock and gypsum beds are located a few miles from the town. Its elevation is 5,769 feet. It is an important shipping point on the Santa Fe Rail-

way and controls the trade of a large extent of country. Near Springer are artesian wells and also a mineral spring, from which bottled mineral water is shipped to all parts of the Southwest. The town is the trade center for the Elizabethtown, Ute Creek, and Cimarron mining districts, and maintains a daily stage line to these points. It is near the splendid irrigation systems of the Maxwell Land Grant Company.

The Weekly Colfax County Stockman is published here. The town has an excellent school system and several churches, and has ambition to become the county seat of a new county, of which southern Colfax County is to form a part.

The Colorado Telephone Company has extended its long-distance telephone line from Raton to Las Vegas via Springer and other towns along the Atchison, Topeka and Santa Fe Railway, thus bettering the communications with neighboring towns as well as the Colorado field.

HILLSBORO.

Hillsboro is the largest settlement in Sierra County and is the county seat, the court-house being a handsome brick and stone trimmed structure. The town is reached by stage from Lake Valley in two hours' ride, the distance being less than 16 miles. Hillsboro has a bank, a weekly newspaper (the Sierra County Advocate), good stores, and is surrounded by gold and silver mines and placers reached by good roads. It is the oldest mining camp in the county, its mineral wealth having been discovered in 1878. The predominating ore of the district is a quartz impregnated with copper and copper pyrites and carrying gold in the proportion of 1 ounce to 4 or 5 of silver. The surface ores, to a depth varying from 50 to 150 feet, are much oxidized and constitute free milling ore. Copper is an important by-product, varying in percentage to the ton from 1 to 20. There are four ore mills in and around Hillsboro. East of the lode mines is an extensive area, comprising several thousand acres and known as the placers. With crude dry washers some $500,000 in gold have been taken from these placers. In the valley between Hillsboro and the mines are warm springs having medical and curative properties. Bath houses have been erected over them. Hillsboro is also the headquarters of several large cattle companies.

CHAMA.

Chama, in Rio Arriba County, is a modern railroad town on the Denver and Rio Grande Railroad, on which it is a division point, and is a shipping point for the wool, lumber, and other products of the county. It has an excellent school, churches, and secret societies. Near the town are stone quarries, from which the stone for the Colorado capitol at Denver was taken. Beautiful ranches and stock ranges surround the town, and near by are several fine trout streams and good hunting grounds. The Denver and Rio Grande Railroad maintains at Chama big dipping vats for sheep. The population of the town is 500.

PART II

ARTICLES ON SPECIAL TOPICS OF INTEREST TO NEW MEXICO.

The agricultural, horticultural, stock, mineral, and other resources of New Mexico are treated in detail in the preceding part under each county and town heading. In this part are included articles on the special phases of New Mexico industries, or on subjects of more than local interest. Most of them have been written by specialists upon the topic, or by those well informed upon the subject which they treat. The topics treated in regular order are:

Agriculture in New Mexico.
Horticulture in New Mexico.
New Mexico sugar beets.
Tobacco in New Mexico.
Range grasses in New Mexico.
New Mexico live-stock interests for the year 1903.
Experiments in pumping for irrigation.
Irrigation in New Mexico.
Climate and consumption.
Geological formations of New Mexico.
The mineral production of New Mexico.
List of mining claims in New Mexico which have been officially surveyed.
Railroads in New Mexico.
Population.
New Mexico Bar Association.
Fort Wingate.
Archæology.
Ancient Aztec ruins in San Juan County.
Navajo blankets.
Mining in New Mexico.
The only court of its kind in the world.

AGRICULTURE IN NEW MEXICO.

By J. J. VERNON.

The States and Territories in the arid and semiarid belt have attracted much merited attention in recent years. Since the inauguration of great irrigation enterprises in the West, and more comprehensive systems of utilizing irrigation waters have been instituted it is recognized the country over that it will have to reckon seriously with the States and Territories in the arid and semiarid sections of the United States in the future from an agricultural standpoint. The eastern farmer and stockman have felt the competition of the West and are trying to adjust themselves to the changed conditions. Eastern bankers do not find the strong demand for money in the West at harvest times as formerly, and they are seeking other fields for investment. The western farmer has money with which to move his crops. The West is practically out of debt. This, in a great measure, is due to the vast resources of the West, largely agricultural, that have long lain undeveloped. The history of the Western States is practically the history of New Mexico.

New Mexico agriculture is attracting more attention to-day than at any former time. Homeseekers are flocking to the Territory in great numbers, preempting and purchasing large areas of land in our fertile valleys, and building up new agricultural communities of considerable importance. New Mexico may properly be called an agricultural Territory, to the truth of which the following facts attest.

The number of persons ten years ago and over engaged in special occupations, in 1900 are distributed among these occupations as follows: [a]

Agricultural pursuits	27,214
Professional service	2,118
Domestic and personal service	19,478
Trades and transportation	7,208
Manufacturing and mechanical pursuits	10,378
Total	66,396

It will be seen by referring to the above table that 41 per cent of the persons in the Territory pursuing gainful occupations are engaged in agricultural pursuits—quite a creditable showing. In the great agricultural State of Illinois, having a population of 1,804,040 engaged in gainful occupations, there are 462,781 persons, or only 31 per cent, as against 41 per cent in New Mexico, who are engaged in agricultural pursuits.

The area and valuation of farm lands and the value of farm property in New Mexico has materially increased since 1890, as is shown in the following table: [b]

	1890.	1900.
Total number of farms	[c] 4,458	[d] 11,834
Acres in farms	787,882	5,130,878
Total value of farm property	$33,543,141	$53,737,824
Lands, fences, and buildings	$8,140,800	$20,888,814
Implements and machinery	$291,140	$1,151,610
Live stock on hand June 1	$25,111,201	$31,727,400

[c] Not less than 3 acres, reporting not less than $500 gross income.
[d] Not less than 3 acres and reporting the sale of not less than $500 in produce.

The table shows that from 1890 to 1900 the number of farms increased 265 per cent, the area of farm lands 651 per cent, the total value of farm property 160 per cent, the value of lands with their improvements 256 per cent, the value of implements and machinery 395 per cent, and the value of live stock 126 per cent. These figures give an idea of the rapid development going on within our borders, and they also are indicative of what may be expected in the future. Another matter that is well worthy of record here is the fact that the producing capabilities per capita of those engaged in agricultural pursuits has increased amazingly. The value of farm products increased in the ten years, 1890 to 1900, from nearly $2,000,000 to a little over $10,000,000 (see Table 58, p. 703, Twelfth United States Census), or an increase of 500 per cent in the ten years, while the agricultural population has not increased 100 per cent. This increase in the per capita production may safely be attributed, in part at least, to a more universal use of labor-saving machinery in agricultural operations. In the above table we find that the value of implements and machinery in 1890 was $263,106, while the value in 1900, ten years later, rose to the considerable sum of $1,151,610, or an increase in value of 395 per cent. The progress of the United States in its rapid commercial expansion has largely been due to the invention and use of labor-saving machinery whereby one man, operating the machine, is able to do the work of two or a hundred men, often doing it better and with less waste of material. This same element has been one of the leading factors that has enabled the western farmer to place his wheat and other commodities upon the English market in successful competition with other and nearer sources of supply. Labor-saving machinery must ever be an important factor in the development of a country or an industry. New Mexico is wisely adopting such aids in creating wealth.

STOCK RAISING.

Stock raising, owing to the great areas of land that can never be brought under the plow, will probably remain one of the leading industries of New Mexico for many years. Of the 27,914 persons engaged in agricultural pursuits, 8,107 are occupied in raising live stock. This number is likely to increase, for in New Mexico, as has already been the result in many parts of the West, the individual holdings of free range inevitably will diminish, while the number of individual holdings will grow larger. This will tend to unite the small range with the valley ranch under one

[a] Twelfth United States Census.
[b] Eleventh and Twelfth United States Censuses.

management, a system which, if it becomes general, has the following possible points of merit:

(1) The infusion of better blood into the stock on the range;

(2) Droughty periods would lose much of their terror;

(3) Greater numbers of animals could be finished and slaughtered for home use, shutting out foreign meat, and

(4) Fewer unfinished animals would remain to be shipped and sold as stockers, resulting in the price of stockers ruling higher.

FEEDING.

The last few years have seen considerable progress in feeding for home market and for shipment. The Pecos Valley probably leads the other parts of the Territory in feeding stock for market. In the last two or three years several hundred head of cattle and many thousand head of sheep and lambs have been fattened for the Kansas City market, netting profitable returns to the feeder.

DAIRYING.

Dairying has kept pace with the demand in the vicinity of cities and towns where the products are sold in the form of milk and cream. There is not enough butter and cheese manufactured, however, to supply the demand, although there has been a considerable increase in their production. In 1889 there were manufactured 105,000 pounds of butter and cheese. This number swelled to 381,000 pounds in 1899.

POULTRY AND POULTRY PRODUCTS.

Annually thousands of dollars are poured into the pockets of Kansas and Nebraska farmers in payment for poultry and eggs consumed in New Mexico, yet we have an ideal country for poultry raising. We have most of the advantages with few of the disadvantages of other sections. Insect pests are no worse, while disease of any kind is rare. Prices are high, being governed by the price of the foreign product plus the transportation charges, therefore the home product has an advantage. It is evident that the New Mexico farmer is taking advantage of these favorable conditions, for the number of fowls increased 250 per cent from 1890 to 1900 and the number of dozens of eggs increased from 280,000 to 840,000, yet there is need of a greatly increased production to supply the demand.

APIARIAN PRODUCTS.

With our mild winters and abundant bee pasture, in the form of alfalfa, tornillo, etc., the apiarian products have increased over sixfold in ten years and are of considerable importance over all the cultivated areas of the Territory.

FARM CROPS.

The following table, taken from the Twelfth United States Census, will give some idea of the importance of several of the leading New Mexico crops:

	Value.	Acres.	Pounds or bushels.
Total cereals	$979,903	96,402	.....
Corn	519,236	41,345	677,305
Wheat	390,616	37,907	603,308
Oats	154,347	15,848	342,777
Barley	12,475	1,110	24,107
Hay and forage	1,427,317	87,458	.....
Beans	73,001	3,349	.....
Pease	20,365	2,220	.....
Sugar beets	16,849	1,298	.....
Irish potatoes	49,552	1,122	72,618
Sweet potatoes	4,588	47	6,180
Orchard products	197,331	.....	.....
Flowers and plants	5,300	11	.....
Nurseries	4,343	22	.....
Vegetables	278,413	6,501	.....
Viticultural products	33,717	.....	.....

ALFALFA.

Much has been written about alfalfa. It is known more or less in every State in the Union, and therefore I need not go into a detailed description. Alfalfa is grown in all the irrigated sections of New Mexico up to an altitude of over 7,000 feet. It is also grown considerably in dry farming sections where there is no irrigation. In New Mexico alfalfa does well on almost every class of soils. The chemical constituents of the soil seem to have little to do with the growth of the crop, provided the surface is level and the proper amount of water is given. It grows well on light, sandy loam, as well as on the heaviest adobe. It is said by an able writer that alfalfa will not stand "wet feet." That is true if he meant it would not grow in a water-logged soil. Where the soil is well drained it will extend its roots to the water table and grow luxuriantly where the water table is only a few feet below the surface of the ground. One might expect alfalfa to fail in heavy clay soil, and it probably would if the soil was not well drained.

The area of alfalfa in New Mexico increased from 12,139 acres in 1890 to 55,467 acres in 1900. The average yield in the Territory is about 3 tons per acre. The cost of production, including taxes, water rent, growing, harvesting, baling, and placing on board the car, does not exceed $4 per ton. There are some large alfalfa farmers that are able to place alfalfa on the car at a much less figure because they have perfected their system of irrigation and handle the hay with improved machinery.

The net profit in growing alfalfa under our irrigation systems is considerably larger than the average net profits realized on wheat and corn in the older agricultural sections. It is a crop that requires little labor, if the field has been made level and the soil well prepared before seeding, after which the operations are simple, resolving themselves into irrigating and harvesting. On many soils one irrigation will produce one crop, which may vary from one-half to 2½ tons per acre. The price of alfalfa varies in different parts of the Territory, depending upon the production, amount consumed by stock being fattened, and the shipping facilities. The demand for alfalfa, aside from that for local consumption, comes from cities and towns, mining and railroad camps, and the thousands of isolated stock ranches scattered over the arid and semiarid sections, as well as a considerable demand from portions of Texas and the Republic of Mexico. At harvest time the price of alfalfa is comparatively low, usually not exceeding $8 per ton, but the forehanded farmer who holds his product until winter usually gets from $10 to $13 per ton. Alfalfa farming has proven very attractive and profitable, and it is not surprising that the area should increase from 12,000 to 55,000 acres in ten years.

As to the feeding value of alfalfa I need have nothing to say, since it is conceded throughout the country that alfalfa leads all other forage crops in its total digestible food constituents and nitrogen contents.

CORN.

Corn stands next to alfalfa in acreage and value of total product. Where water for irrigation is plentiful the yield of corn in New Mexico compares favorably with the yield of this crop in the corn belt. Where there is plenty of water this is a paying crop.

Kaffir corn grows as well if not better than corn. In some sections of the Territory it is grown almost exclusively for feeding stock. In the Pecos Valley kaffir corn is one of the leading crops. It yields from 25 to 50 bushels per acre, besides producing a large quantity of excellent stover. Both the grain and stover are fed to cattle and sheep in the fattening pens. Kaffir corn is an excellent drought resister

WHEAT.

Wheat is a sure crop in New Mexico if sown early. The yield of wheat per acre in New Mexico is equal to the yield in the leading wheat-growing States. Its production, however, is handicapped by the antiquated method employed in harvesting and threshing. Perhaps 90 per cent of the entire wheat crop of the Territory is harvested with hand sickles, threshed by treading with horses or goats, and cleaned by winnowing in the good old way that Noah used. Self-binders and power threshers are in use in some sections of the Territory, and with the general use of such machinery the growing of cereals will become more extensive and profitable. It has been demonstrated by the agricultural experiment station, as well as by several farmers, that the self-binder will work over the irrigation borders successfully. Nearly all of the cereal crops grow well here, and there seems to be no good reason why machinery should not be more generally employed in harvesting and threshing these crops.

THE FOURTH CROP OF ALFALFA OF THE YEAR 1903.

POTATOES.

By many the potato has been considered an impossible crop in New Mexico, and yet the value of the potato crop in New Mexico in 1899 was nearly $50,000. The difficulties in growing potatoes seem to be those of varieties and management under irrigation. Colorado failed in her first attempts to grow potatoes, but now this crop forms an important source of wealth to her. Sweet potatoes are grown here without difficulty.

ORCHARD CROPS.

There were 719,057 bearing fruit trees in 1900, which produced 263,870 bushels of fruit. The value of all orchard products in 1899 was estimated at $197,331. There is a noticeable increase in the amount of dried and evaporated fruits, which indicates that culls and unmarketable products are being more generally utilized. In the near future we will probably be able to supply our own markets with jams, jellies, marmalades, etc., manufactured from such fruits as generally go to waste, thus effecting a great saving.

VEGETABLES.

All kinds of vegetables are successfully grown and our mild winters render the growing of winter and early vegetables an important occupation which furnishes employment for a large number of persons.

VITICULTURAL PRODUCTS.

There were 1,186 acres in bearing vines in 1890 and 9,000 acres of young vines. The total value of property devoted to this industry in 1890 was estimated at $3,055,800.

NEW CROPS.

Tobacco, cotton, and hops.—While it has been known that these crops could be grown, yet they have never been planted on sufficiently large areas to demonstrate their value. In the vicinity of Albuquerque several acres of tobacco are being grown this season and definite results can be expected.

Growing cotton will be confined to the southern limits of the Territory. Valuable conclusions will no doubt result from the crops being grown in the southern Pecos Valley this year.

Hops will grow well and fruit heavily. It would seem to be a promising crop for this section.

DIFFICULTIES.

It would be untrue to say that New Mexico has no difficulties to encounter. The difficulties in New Mexico, however, are those usually met in any partly developed country. We have few railroads, and the distance to large markets is great. We need more labor-saving machinery and a better knowledge of how to use it. The greatest hindrance to progress, however, is the irregularity of the flow of our streams. They overflow their banks, running to waste in winter and in flood seasons, and too often dry up in midsummer. We need to interest capital in the development of irrigation systems in the Territory or secure Government aid in the following irrigation enterprises:

(1) For building reservoirs for storage of flood and waste waters of our streams;
(2) For building reservoirs for the storage of flood waters from the mesas and foothills;
(3) For exploration, in order to extend our artesian areas; and,
(4) For developing the underflow.

ADVANTAGES.

Soils.—The soils of the valleys of New Mexico are probably superior in productive capabilities to the alluvial soils of the prairie States. The secret of their great producing power probably lies in the large amount of sediment contained in the irrigation waters. The Nile Valley, with its irrigation waters loaded with sediment, is considered one of the most fertile valleys in the world, and yet in New Mexico we have a number of Nile valleys in miniature. It is no wonder that the visitor is surprised at the luxuriance of our vegetation.

Freedom from insect pests.—The crops of the Territory are not seriously troubled by either insect pests or fungous diseases. Much sunshine and a dry atmosphere prevent

the growth of fungous diseases, and, therefore, these diseases are not likely to become troublesome in New Mexico. The insect pests that have found their way into the Territory seem to be quite easily controlled by proper treatment.

Two crops.—It is quite a common custom, especially among the native population, to grow two crops on the same land in one season—that is, a crop of wheat and a crop of corn. This system would be inadvisable in the rain belt, but in sections where irrigation is employed and the water applied is loaded with rich sediment, it is a question if any serious criticism of this practice can be rendered.

Climate.—New Mexico's climate is a great source of wealth to her people. Agricultural operations, especially in the southern half, are carried on throughout the year. Ground may be plowed any time in the winter, and cereals and alfalfa are sown during this season of the year, thus leaving the summer growing months free in which to harvest the cereals crops and the four or five cuttings of alfalfa.

HORTICULTURE IN NEW MEXICO.

By Fabian Garcia.

There are many thousands of acres in New Mexico, aside from those already in use, which can be utilized for horticultural purposes, provided water for irrigation purposes can be had. The portions of the Territory which are suited to horticulture are the river bottoms or valleys and the smaller valleys along the mountain streams. There are also large areas, commonly known as the "mesas" or uplands, which have the finest soil, and which would produce good crops if the water could be raised up to them. The largest horticultural districts are the Rio Grande Valley, extending from north of Bernalillo south to the Texas line, taking in portions of the counties of Sandoval, Bernalillo, Socorro, Sierra, and Doña Ana, the Pecos Valley, mostly in the counties of Chaves and Eddy, the Animas Valley, in San Juan County, and the Mimbres, in Grant County. Other notable but smaller sections are found in the counties of Otero, Lincoln, Luna, Santa Fe, Mora, and San Miguel. The altitude of these different sections varies probably from 3,000 to 7,500 feet.

The soil varies from a sandy to a heavy clay. The soil, however, is ordinarily fertile enough to produce good crops if plenty of water is obtainable for irrigation. The fertility of our soils is demonstrated by the rank and rapid growth of the trees and plants.

These climatic conditions throughout the Territory are, on the whole, favorable to the growth of fruits and vegetables. It is true, however, that, owing to the great differences of climate, not all varieties of fruits or vegetables will thrive equally as well in all sections. This emphasizes the importance of the adaptability of plants to the different sections, which fact is being realized more and more by those intending to enter into horticultural work.

Since New Mexico lies in the arid zone the rainfall can not be depended upon for growing of fruits and vegetables. The rainfall is insufficient, especially in the larger valleys, for the development of crops. Occasionally, in the mountain districts, where the rainfall is more abundant and the humidity greater, some crops of fruits and vegetables are grown without irrigation, but one should not depend altogether on this. Irrigation is the only sure means of growing crops in New Mexico. By this means, other things being equal, the largest crops of excellent quality can be grown, and then, too, the danger of floods and droughts is largely mitigated. It is true that the irrigation of fruits and vegetables costs money, energy, and some skill, but the rewards are great and sure. With irrigation the crops need not suffer from either too much or too little water and the land can be made to produce abundantly every year.

In order to bring into play the favorable soil, water, and climatic conditions to the best advantage the adaptability of varieties of plants should be considered. It is not infrequently found that some varieties, although they may be among the leading ones in other States, are partially or entirely worthless in New Mexico, particularly of the stone fruits. On the other hand, some less valuable kinds in other States succeed admirably in many parts of the Territory. Such facts show the importance of planting the kinds best adapted to New Mexico conditions. In other words, the proper selection of varieties is an important factor in the success of the horticultural operations, and this is more and more being realized by intending planters.

Fruit growing and vegetable growing are the two more important branches in horticulture in New Mexico. Fruit growing is the most developed and most remun-

erative. In some of the horticultural sections of the Territory it is assuming almost gigantic proportions, with practically no serious obstacle in the way of its becoming still greater provided proper precautions are taken to keep down any insect and fungus pests that may appear, as is done in other fruit-growing States. The horticultural sections are preeminently fruit growing, and the orchard fruits are equal to, if not superior, to those grown in other States.

Of all the fruits, the apple is the most extensively grown and the most profitable crop. Notwithstanding the topography of the Territory this fruit is well adapted to the different horticultural sections. The counties of San Juan and Santa Fe in the north, Bernalillo and Socorro in the central, Grant, Doña Ana, and Otero in the south, and Lincoln and Chaves in the southeast, are particularly known for their apples. New Mexico is now known not only in the United States, but abroad, for its fine apples. Its fruit is placed in competition with the world at the great expositions. In 1901 at Buffalo the apples from New Mexico were conspicuous, and the fruit from Roswell, in Chaves County, received a first prize, while in 1900 the New Mexico apples were carried across the continent and the Atlantic Ocean to the Paris Exposition. There New Mexico was counted in with the best apple-growing States of the Union, as specimen apples from Doña Ana received second premium. This may give an idea as to the kind of fruit that can be grown in the Territory. Not only is the fruit of superior quality, but the crops produced by the trees are enormous; as a rule the trees tend to overbear.

The apple orchards vary from small family places to very large commercial plantations. The larger commercial orchards are located in the Mimbres Valley, the Mesilla Valley, and at Roswell. The Roswell district, which seems destined to become the largest apple-growing section in the Southwest, is particularly noted for its large orchards. The largest bearing orchard is that of Mr. J. J. Hagerman, and comprises something over 500 acres. Aside from those already planted there are a number of very large orchards to be planted the coming winter. The most profitable varieties throughout the Territory are the winter apples, such as the Ben Davis, Gano, Missouri Pippin, Winesap, and Mammoth Black Twig. In a less degree the early varieties are also profitable; among the leading kinds may be mentioned the Early Harvest, Red June, Yellow Transparent, and the Maiden's Blush. The apple seems to be free from the common diseases and insect pests except the codling moth. This insect is beginning to be quite a serious pest in some of the apple-growing sections. The codling moth is a cosmopolitan insect, and where the apple is grown on a large scale it is almost sure to become troublesome, and after it appears in a locality it is impossible entirely to eradicate it by any of the known remedies. However, its ravages can be very materially reduced by frequent sprayings.

Other pomaceous fruits, like the pear and quince, thrive as well as the apple, but these are not so important nor are they planted in such large areas as the apple. Only small plantations are found in the apple-growing sections. The pear has a marked adaptability, the trees usually bear early, are among the best drought resisters, and are long-lived and hardy. The fruit, especially of the large varieties like the Bartlett, Idaho, Beurre Easter, grow very large and are of fine quality. At present the pear is as free from diseases and insect pests as the apple. The dreaded pear blight, which is so bad in the East, has not threatened the pear industry. On the whole there is a bright future for more extensive planting of this fruit.

The peach, which is grown with more or less success throughout the Territory, is perhaps second in importance at present. While peaches are grown in all the fruit-growing sections, the larger commercial orchards are generally found in the southern portion of New Mexico, and the largest of these are located in the Mesilla Valley and at Carlsbad. These districts are especially adapted to certain varieties of peaches which find their way into the Colorado and Kansas City markets. The early-ripening peaches, such as the Alexander, Sneed, Waterloo, Arkansas Traveler, and Hyne's Surprise, are among the most successful and sure bearers. This is due to the fact that as a rule the early varieties are the late bloomers, blooming late enough to escape the late spring frosts, which are so common in New Mexico and which oftentimes prove so fatal to the late-ripening kinds, such as the Elberta, Wonderful, Stump the World, Old Mixon Free, and others. The late-ripening peaches ordinarily bloom from eight to fifteen days earlier than the early kinds. The peach trees usually begin to bear at 3 years old from the time of planting. The tendency of the trees is to overbear, and it becomes necessary to thin them in order that the fruit may not be too crowded. The late varieties are only reasonably sure of bearing, and it is only occasionally that they have a full crop. In size and quality I believe the New Mexico peaches are not excelled by peaches from other peach-growing States. It is the common opinion of those who have tasted both the California and New

Mexico peaches that the New Mexico peaches are the better in quality. The fruit is as a rule highly colored, due perhaps to the almost continuous sunshine during the ripening period. The peach is free from the serious diseases and insect pests and the worst drawback (and this is principally with the late kinds), the late spring frosts. The trees, however, are ordinarily short-lived. Probably the profitable period of the peach tree in New Mexico is from ten to twelve years. By planting orchards at intervals of five to eight years a profitable orchard can be kept up almost indefinitely.

In New Mexico, as in other places where the apricot grows, it has given evidence of a longevity greater than that of any other orchard tree, with the possible exception of the pear tree. It is not uncommon to see some very old seedling apricot trees growing in some of the Mexican home places in the Mesilla Valley, and it is claimed that at Santa Fe seedling apricot trees are known to be about 200 years old. The fruit from the improved kinds is as large and as good in quality as the California apricots, but the trees are not regular nor heavy bearers. Ordinarily the apricot crop is a light one and occasionally a total failure. The reason for this is that the trees bloom too early in the spring. A test conducted at the New Mexico Agricultural Experiment Station of a large number of varieties shows that all of them have that tendency. Out of twenty or more varieties none of them have as yet produced what is considered a commercial crop, although some of them have had light crops most of the years. As a commercial fruit the apricot in New Mexico may be considered to be of little or no importance at present, and from the data at hand it is believed its culture will not assume commercial proportions for reasons already given. None of the varieties tested can be recommended for extensive planting. However, the Blenheim, Moorpark, Royal, St. Ambroise, and Luizet are desirable for home planting.

Cherries are only raised on a small scale. The trees of both the sour and sweet groups grow well. Varieties of the sour cherries are the best bearers, but the fruit, however, is not as large as that from the sweet varieties. Generally speaking, the sweet cherries, like the Bigarreaus, Duchess, and the Governor Wood, are of little or no value as bearers, for the reason that, as a rule, they bloom too early. The sour varieties predominate in New Mexico, as they have proven to be more regular and sure bearers. The Early Richmond, English Morello, Ostheim, and the Montmorency are among the leading varieties.

The plum, while not so generally planted as the apple, peach, or pear, is making a place for itself in New Mexico. It has been but a comparatively short time since this fruit was considered to be of any importance, and even now the areas planted to it are very limited. However, conditions are changing, and there is a growing demand for it. The tree is perfectly hardy, although there is some variation as to the fruitfulness among the trees of the different types. The three types are, first, the European plum, which is the plum that gives rise to the old varieties, such as the Green Gage, Yellow Egg, Damson, and the various prunes; second, the Japanese plums, which are entirely different from the former type; and third, the native type, such as the Wild Goose. As already stated, it is a well-established fact that the selection of varieties is an important consideration, and this is particularly true in regard to the plums in New Mexico. While the soils and climate are well suited to the tree growth, it is now thoroughly shown by the experience of fruit growers and by experiments at the New Mexico Agricultural Experiment Station that the Japanese plums are practically worthless throughout the Territory, owing to the liability to late frosts. On the other hand, the European plums do admirably. The trees are thrifty, heavy, and sure bearers. These plums are well adapted in every respect to the New Mexico conditions, and large and excellent quality fruit can be produced. A few of the leading kinds of this group which have been tested at the experiment station are the Clayman, Jefferson, Imperial and Transparent Gage, Yellow Egg, Pond's Seedling, Washington, and the French and German prunes.

The native plums are also well adapted, but there seems to be a wider range as regards their blooming period; some varieties, like the Caddo Chief, bloom too early to escape the frosts; others, like the Wild Goose, Golden Beauty, and Pool's Pride, bloom late and are sure bearers.

Perhaps the grape occupies third place in New Mexico horticulture, and the Territory is also well known for its grapes. The European, or the so-called California, grapes succeed well, and these are the kinds grown for the market. The native or American grapes are not so satisfactory for commercial purposes, and are grown only for family use. The European grape has been cultivated for over a century, but its culture, generally speaking, has been confined to the southern and hotter valleys, and particularly to the Rio Grande Valley from the Texas line to Santa Fe. The varieties that constitute the commercial vineyards are the Mission, Muscat of Alexandria,

and more or less the Gros Colman and Flame Tokay. These grapes are shipped to the Texas, Louisiana, and Colorado markets, where they have given New Mexico a reputation for fine grapes. The Mission grape, while quite late in ripening, is the most popular and possesses some excellent qualities as a table and wine grape, and is the grape of New Mexico at present. The Rio Grande Valley, and particularly the Mesilla Valley, is especially suited to the grape, and when its possibilities in this direction are more fully understood by the people this valley may yet become a vast grape-producing section.

The grape-shipping season extends from about the 20th of August till the last of September. This short season is due to the commercial grapes being all midseason varieties. Early and late ripening varieties need to be added to the large vineyards in order to extend the shipping period. In view of this need, the experiment station has started a test of a large number of varieties, and already some valuable data are being gotten in regard to the early foreign grapes, which ripen about two weeks earlier than the Mission. Some of these new grapes are the Muscat, Precoce du Puy de Dome, Thompson Seedless, and some of the Chasselas group.

New Mexico produces vegetables as well as fruit, and wherever water for irrigation can be had many vegetables do well. While truck gardening is not carried on very extensively, due perhaps to the great distance to the large markets and to the high freight rates, it is nevertheless increasing every year. Some of the horticultural sections are especially suited to certain vegetables. A few of the more important vegetables are here mentioned:

Celery can be grown excellently in those parts of the Territory where the soil and climatic conditions are favorable and where some skill in growing it is exercised. Among the best known celery-growing sections are those in the mountains, around Albuquerque, and at Roswell. The latter place is probably the most noted for its celery. It produces a large quantity, but not enough to supply the demand. It is claimed that the Roswell celery is equal if not superior to the product from California and Louisiana, and will sell equally as well in the markets outside of the Territory.

Fine Rockyford cantaloupes can be raised in New Mexico. Cantaloupe growing is getting to be quite a business in the southern portion of the Territory. Some are grown at Las Cruces for the early market, which are shipped mostly to the local markets in the Territory, but the large areas are found at Carlsbad and Roswell. From these places carloads of cantaloupes are sent to the eastern markets. It seems that there is no material difference between the New Mexico and the Colorado Rockyford cantaloupes. New Mexico, however, has the advantage over Rockyford inasmuch as the cantaloupes may be placed on the market earlier.

The tomato grows well and is quite an important crop in New Mexico. While it is grown in all the horticultural sections, the largest fields are in the Mesilla Valley. A canning factory is established at Las Cruces which cans a large quantity of excellent tomatoes. The canned tomatoes are sold in New Mexico, Texas, Arizona, Colorado, and other States. The demand for these tomatoes is greater than the supply. This canned product has also added to the reputation of the Territory.

New Mexico is also known for its onions. While at present the area planted to onions is very limited, only about 160 acres, and the production insufficient to supply even one-tenth part of the home consumption, there seems to a bright future for it, and the chances are that it will become a crop of great commercial value to the Territory. Large and fine quality onions can be grown throughout New Mexico. Probably the Rio Grande Valley is the largest onion-growing section, and here is where the old "El Paso" onion, which has given New Mexico a reputation as an onion-growing country, grows so well. It is not infrequent to see specimens weighing 1½ pounds. The yield per acre is as large here as in other States, although the United States census report for 1900 gives a very low average of about 9,000 pounds. The results at the experiment station show that such varieties as the Red Victoria will produce 32,000 pounds per acre.

The branch of horticulture that is less developed in New Mexico is that of floriculture, but even here marked and rapid strides are being made, particularly in home adornment. Many of the flowering plants, like the rose, violet, chrysanthemum, and sweet peas, do well in New Mexico.

While horticulture is one of the leading interests in New Mexico, and people of all classes are more or less interested in some branch of it, the possibilities of the Territory in this direction are not fully realized. Only a small part of the land that is adapted to horticulture has been used. In recent years there seems to be more interest taken in horticulture, and no doubt marked improvement will soon take place in this line.

NEW MEXICO SUGAR BEETS.

By R. F. HARE.

Since 1895 the New Mexico Experiment Station has devoted much time in experimenting with the growing and analysis of sugar beets to determine whether the soil and climate of our Territory was suited to the growth of beets with a high saccharine content, as well as to determine whether the conditions in its various farming localities were such as to warrant the establishment of beet-sugar factories.

The work has consisted chiefly in testing time of planting, methods of cultivating, time of harvesting and its effects on the yield, sugar content and purity of juice, the effect of size of beet on the sugar content, and the cost of production.

During the seasons of 1897 and 1898 some intelligent farmers in the respective counties cooperated with the experiment station in this work, and by this means reliable information relative to cultivation and other points was secured for the entire Territory.

The results of all the work done by the station are embodied in Bulletins Nos. 26 and 29, and can not be repeated in detail here for lack of space. Both of these bulletins are, however, available for free distribution, and may be had by anyone upon application to the director, New Mexico Experiment Station, Mesilla Park, N. Mex.

Reference to these bulletins shows quite conclusively that New Mexico ranks among the first of those States best suited to the growth of high-grade sugar beets. These investigations also showed that in nearly all localities where good beets could be grown there may also be found fuel, limestone, and water of good quality, as well as cheap labor.

In the face of these facts, and those below noted, it seems that New Mexico should, with the proper enterprise on the part of her citizens, soon have sugar factories. Some 40 sugar-beet factories are in process of erection in the United States now, and New Mexico should have its share of these; but for several reasons, which might all be overcome, none of them are within our borders.

First of all it has not been sufficiently advertised that our soil, climate, and other natural conditions are so well suited to the growth of sugar beets.

Our conditions are very similar to those found in Colorado. In fact, in some respects we have the advantage, for both labor and land are cheaper in New Mexico than in Colorado. Yet within the past six years Colorado has established six factories and has others in process of erection.

The Denver Chamber of Commerce, the railroad companies of the State, and other organizations, with the assistance of their agricultural college, saw the advantages to be gained to the State in the establishment of these factories, and they were very active in securing them.

No doubt when it becomes known that New Mexico is even better suited than Colorado for both the growing of beets and the manufacture of sugar, capital will soon develop this industry as it has others of our resourceful Territory. It is to be hoped that the commercial clubs and the industrial commissions of our railroad companies will follow the example set them by similar organizations in a sister State.

The fact that we have not yet received statehood is no doubt another reason why we have no sugar factories. So long as we remain a Territory capitalits will be slow to invest money here, however promising the outlook may be. Our Territorial legislature has wisely passed a bill exempting all sugar factories from taxation for a period of six years, however, and with this inducement and the enterprise of our citizens we may succeed in getting some sugar factories.

A third possible reason why we have no sugar factory is doubtless due to the fact that in 1896 a small 200-ton factory was established in Carlsbad, N. Mex., and was in successful operation only two years. The discontinuance of this factory, however, would not affect the establishment of others, if the facts in the case were known. It was in no way due to the low sugar content of their beets, as may be seen from analyses made both at this station and by the Department of Agriculture. Neither was its failure due in any way to natural causes, but resulted from mismanagement, and ignorance of beet culture on the part of the farmers, who undertook to grow the beets. Those States that have been most successful in securing factories have all had failures. Michigan has 5 factories out of its 17 not in operation, yet it is reported to have about 30 in process of erection. Colorado also has 2 factories not in operation.

Concerning the failure of the Carlsbad factory, Bulletin No. 52, United States Department of Agriculture, says:

"There should not, however, be anything discouraging in accidents of this kind, as the conditions upon the whole are such as to warrant the expectations of final success."

That section of New Mexico around Carlsbad in the Pecos Valley, as well as the Mesilla Valley on the Rio Grande, are not, however, so well suited to the growth of high-grade beets as other parts of the Territory, because of the fact that the weather gets too hot for the development of sugar in the beet during the summer months.

The United States Department of Agriculture, through a series of experiments for a long number of years, has proven conclusively that a mean temperature for the months of June, July, and August, of about 70° F. is the ideal temperature for the growing of beets of high saccharine content. The isothermic sugar zone, or that belt of the United States States best adapted to the growth of sugar beets, has been carefully mapped by Dr. H. W. Wiley, chemist of the United States Department of Agriculture. This map is embodied in Bulletin No. 52 of that Department, and is also reproduced in Bulletin No. 29 of the New Mexico Experiment Station. It extends from east to west across the United States, and embraces that portion having a mean summer temperature between 69° and 71° F. Entering the northern boundary of Colorado it passes through the entire State and into New Mexico, where it forms a loop in the extreme southern part of the Territory, somewhere north of and near Las Cruces, and passes upward again and out in the extreme northwestern part. Thus we see that, with the exception of the Lower Pecos and Mesilla valleys, the entire agricultural part of New Mexico has ideal climatic conditions.

The results of the work done at this station prove the map to be correct so far as New Mexico is concerned. All beets grown in New Mexico, when fully matured, have shown a high sugar content, except those grown in the valleys above referred to. The analysis of beets grown in these two valleys, while not showing so high a percentage of sugar as those from other localities in New Mexico, will compare favorably with an analysis of beets grown in other States.

Doctor Wiley, who is undoubtedly the principal authority on sugar beets to-day, has the following to say concerning New Mexico:

"It is evident that there are many localities in New Mexico where conditions of temperature are most favorable to the growth of beets. There are also large areas of comparatively level land which are capable of irrigation. Wherever the temperature of these regions is sufficiently low to permit the proper development of the beet, and where sufficient water for irrigation can be secured there is little reason to believe that the industry may not be established and prove to be fairly profitable. While the summer days of New Mexico are not so long by an hour or more as in the regions farther north, the amount of sunshine which the growing beets will receive is practically as great as in more northern localities, because of the comparative absence of cloudy and rainy days. The remarks which have already been made in regard to the growth of beets on irrigated areas apply to New Mexico. This is a subject which demands the most careful scientific study, and the work which is now doing by the Agricultural Experiment Station of the Territory is certain to bear excellent fruits in the near future."

The same author, in Bulletin No. 52, Chemical Division of the United States Department of Agriculture, tabulates analyses of sugar beets grown in the different States and Territories. Let us for the sake of comparison select from this table only those States in which sugar-beet factories have been established and compare them in the table given below with the results given for New Mexico.

The Beet Sugar Gazette for June, 1902, gives a list of 40 factories which were at that time in successful operation in the United States. They were distributed as follows:

Michigan	12
California	8
Utah	6
Colorado	4
Nebraska	3
New York	2
Oregon	1
Washington	1
Wisconsin	1
Ohio	1
Minnesota	1

When the average of all analyses of beets from these States made at the Department of Agriculture are compared with those made at the same source for New Mexico it will be seen that New Mexico-grown sugar beets gave a higher percentage of sugar than those of any State which at that time had sugar factories in operation. It will also be observed that the percentage of purity of juice from New Mexico is very high.

Sugar content and purity of juice in New Mexico beets and beets from those States in which beet-sugar factories have been located.

State.	Sugar in beet.	Purity of juice.
	Per cent.	*Per cent.*
Michigan	14.7	81.1
California	16.8	.....
Colorado	13.6	76.7
Utah	14.3	81.1
Nebraska	12.9	76.9
New York	15	82.4
Oregon	(a)	(a)
Washington	13.7	80.7
Wisconsin	15.8	83.3
Ohio	13.8	79.1
Minnesota	11	79.2
New Mexico	17.2	82

a Results not given in table.

It is estimated that the people of New Mexico consumed 15,750,000 pounds of sugar last year. Not 1 pound of this sugar was raised in the Territory, notwithstanding the fact that our natural conditions are better suited to its growth and manufacture than almost any place in the United States, and possibly in the world. Our citizens must awake to the advantages to be gained by establishing factories in New Mexico. Not only will the farmers be profited thereby, but all classes of labor will be furnished employment, and the neat sum of about $800,000, now spent elsewhere for sugar, will remain in the Territory.

TOBACCO IN NEW MEXICO.

By S. E. Edmunds.

Tobacco has been cultivated in New Mexico for hundreds of years. It is more than likely that tobacco originated here and found its way into other countries. Wild tobacco, called "puncha," grows all along the foothills of the mountains. The natives here continue to grow tobacco of seed from the original plant, preferring it to Habana or any other variety. The cultivated plant is very similar to the native, except it is longer, the aroma being the same. The leaf is thicker and stronger than other cigar or smoking tobaccos. The natives do not sow the seed in beds and transplant, but drill in rows. The plants grow from 5 to 5½ feet high and have about 40 leaves. They are small and resemble Turkish more than any other variety in growth and shape of leaf. Five or six years ago a successful gardener near Albuquerque, Herman Blueher, concluded that Bernalillo County would produce a superior article of cigar tobacco. Unfortunately he secured seeds of mixed varieties. The leaf was badly shaped, being almost as broad as it was long, with very coarse stem and fiber. Mr. Hunter, a practical tobacco raiser from Kentucky, set out two crops with plants from this seed near the town of Bernalillo. The crop was cultivated as in Kentucky, in rows 3 by 3½ feet. He did not know the effect of this very dry climate on tobacco, and put his crop in the barn, allowing it to cure naturally, as in Kentucky. The leaves dried rapidly and cured a greenish color, which greatly diminished its value. I tried this tobacco in cigars and in the pipe, and I unhesitatingly say that the aroma was superior to any tobacco I have used. I have used it constantly for the past few months, and prefer it to any brand of the manufactured article. Mr. Hunter's estimate was 3,000 pounds per acre. The cured leaves from eight plants weighed 11 pounds. It sold in the leaf for 25 cents per pound. The success of this experiment induced some of the leading business men of Albuquerque to make further experiments with pure seed of the best varieties.

On April 1, 1903, the Rio Grande Tobacco Company was formed, with myself as manager and Mr. Hunter as assistant. Eleven small beds were prepared in the gardens of Herman Blueher and Mann Brothers on the outskirts of Albuquerque. Sumatra Turkish, Habana, Connecticut, Virginia, and Kentucky burley seed were sown and covered with glass. This was necessary, as it was late in the season and the plants had to be forced. If the beds had been sown late in February or the early part of March a covering of canvas or cheese cloth would have been sufficient. Suitable

lands, situated about 5 miles north of Albuquerque, were selected for the experiment. The first transplanting work was done on May 26 and finished July 10. It remains to be seen which of the two plantings will produce the finest tobacco. The heavy rains in June (a very unusual thing at that time of the year) delayed operations very much. The crop is growing nicely and promises a fine yield of superior quality, with points in favor of Kentucky burley and Turkish at this time.

I am of the opinion that this is truly a bright tobacco section and that tobacco of all varieties will grow well and have an unusually fine flavor and aroma. Suitable buildings are being prepared in which the curing will be done by steam. The same conditions can be produced with steam that exist in curing tobacco in Virginia, Kentucky, or Habana, and the result must be the same. Several acres of Sumatra have been planted between rows of Kaffir corn 6 feet apart. We hope to show by this experiment that the corn will give sufficient shade to the plants to make a very fine leaf and that the great expense of covering the field with canvas will not be necessary.

I am sorry the crop is not further advanced, so I could give you more information. Everything points to success.

I append the following self-explanatory letter:

LOUISVILLE, KY., *April 16, 1900.*

DEAR SIR: Please find inclosed some samples of Habana tobacco. This tobacco cost $3.85 per pound in this city; and I got it from a man who imports 10,000 pounds at a time. He is one of the finest judges of tobacco of this kind in the country, and says that if you would have your tobacco properly attended to that it would be all right, but of course not so good as the sample I mail you. But from what I told him about your climate and soil he says if you don't understand all about raising, curing, and taking care in drying and getting the nice color to the leaf, you should get a good man that does fully understand it and he thinks you can raise a tobacco that will be worth $3 per pound, if you get a good Habana seed to start with. I took it to several tobacco men who are good judges of American tobacco, but it is hard to find one that can tell about this tobacco of yours. I had been to several tobacco men before and they all speak very highly of it, and one man, Mr. Glouer, who is a tobacco inspector and does nothing else, said there was a fortune in raising tobacco if it was done right.

When properly dried and cured, three or four of them took and filled their pipes and tried it, and all of them were old experienced tobacco men. I told them what your scheme was and what your business was. They said that if you could raise such tobacco as that you would soon quit raising garden truck. Well, to tell the truth, every one who has seen it said that it would make a good smoking tobacco either for pipe or made up in cigars; but said you would have to get the proper color in it to make a good wrapper for cigars. They said that they were raising tobacco in Texas almost equal to Cuban tobacco, but that it did not have the flavor to it that this had.

Now it seems that the only thing you have to do is to get a good man from somewhere that understands fully the raising and curing and coloring of tobacco and you have the very best thing to make a fortune out of if properly attended to.

Hoping this will be satisfactory, and if you should want any other information or assistance about getting a man I will do all I can for you.

Yours, truly,

FINIS CARTWRIGHT,
No. 728 East Chestnut street.

Mr. H. BLUEHER,
Albuquerque, N. Mex.

Mr. Blueher has experimented with the finer grades since with marked success. This year the Albuquerque Commercial Club has taken the matter up, and a company has been formed which has now about 30 acres of the different varieties under cultivation, which will be a practical test of the success of the venture in New Mexico. The prospects are now most flattering and the superintendent and expert from Kentucky is most confident.

RANGE GRASSES IN NEW MEXICO.

There are about thirteen or fourteen different plants indigenous to New Mexico that, curing on the stalk, without cutting or labor of man, comprise the great bulk of the valuable fattening food for range stock. A short description of each is given below.

The majority of the native uncultivated forage plants of New Mexico are grasses, and the others, such as sotol and prickly pear, impress one as rather queer stock foods. The grasses of this class belong to two different groups—those which grow in the moist and alkaline soils of the valleys and those which are found on the mesas, and whose only supply of moisture is the little rain that falls during the year. Where irrigation is possible the best of all forage plants—alfalfa—can be raised in such great abundance that the cultivation of few other hay or fodder crops is attempted.

Hilaria mutica (*Galleta grass*).—This grass is found principally upon the high plains on both slopes of the Rocky Mountains. It is also known in localities as "black gramma;" is a perennial grass, spreading by means of thick, scaly, underground stems, the roots of which are very nutritious, and stock seem to relish them.

Paspalum distichum (*joint grass*).—This grass is also known as "knot grass" in some localities. It is adapted to warm, moist soils of akaline tendency, and in New Mexico is most abundant on lowlands that are flooded occasionally, and upon the ditch banks late in the season. It is cut by the natives to be fed green to stock before corn has matured. This grass is said to have some medicinal qualities.

Eriochloa punctata (*Hamil*).—Irrigated but uncultivated fields usually produce an abundant crop of the above-named grass each season. After the corn is "laid by," or during what little rain we have in the summer, this grass appears in the cornfields, along the ditch banks and the fence rows, and makes very rapid growth during the hot days of August and September. It produces an abundance of seed, and will reseed the ground each year. Land once seeded with it would produce a crop of fair hay after a crop of wheat has been taken off, and, so far as judged from an analysis, should be a valuable forage plant.

Panicum crus-galli (*barnyard grass.*)—This rapidly growing annual is widely naturalized over the western and southern parts of the United States. As is indicated by its great geographical range, it has great powers of adaptation to climatic condition and is very variable, two well-marked varieties being recognized. It varies in height from a few inches to 5 feet and over, but the usual height is 3 feet. The natives cut this grass and feed it to their stock while green, before the corn matures. There is a difference of opinion as to the value of this grass as a hay crop. Some think it very valuable, while others think it worthless. It would be excellent to feed with alfalfa, and the two properly mixed would make a first-class combination.

Panicum obtusum (*grapevine mesquite*).—This is one of the native southwestern grasses, found generally in the rich, loamy bottoms of the river courses, very rarely appearing on the mesas. It is a perennial which spreads rapidly, grows about a foot high, and produces a rather strict panicle of flowers. Stock seems to relish it. It does not grow tall enough to cut for hay, but would make a very fine pasture grass if supplied with water; its habits of growth and its great vitality would tend to prevent its being tramped out by stock.

Muhlenbergia texana (*Texas drop-seed grass.*)—This is a perennial, growing upon the mesas and the dry, rocky hillsides. It is sometimes known as the "gramma grass," and is probably as valuable as any of the true gramma grasses; it is also called "mesquite grass." This plant rarely exceeds a foot in height, but it is a grass that is much relished by stock on the range. Occasionally, when the summer rains have been heavy, it is cut, cured, and baled along with the gramma grasses and others, and makes a very valuable hay.

Lycurus phalaroides.—This is a common grass, and is usually found on the rocky ridges and hills of the plains, and not rarely in the mountains. It has been collected at an altitude in New Mexico of over 6,000 feet above sea level. It grows in bunches under the most favorable conditions to a height of 18 inches. It would only be valuable for stock when fed with something containing much protein and fat.

Sporobolus airoides (*bunch grass*).—This is one of the commonest of all the native grasses in the western United States, and is found in all arid portions of the Rocky Mountain region from Montana to Texas and west to California. It is perennial, forming dense tussocks on flat, dry, alkaline plains. While it is of no value as hay, it is considered a good pasture grass in some sections, and it certainly is of great value upon those alkaline "flats," which will support few other kinds of vegetation, since it flourishes in such localities and stock relish it.

Doctor Rothrock says that this grass and another closely related species (*S. cryptandrus*) furnish a fiber which might be utilized in making paper or cordage.

Bouteloua oligostachya (*blue gramma*).—This is the common gramma, and is also known as "mesquite grass," and is frequently mistaken for the "buffalo grass" (*Buchloe dactyloides*), with which it at one time formed the bulk of the pasturage upon the western plains and ranges. With the increased number of animals upon the ranges these grasses are being somewhat killed out, since they are very rarely

allowed to seed, and thus few new plants are produced each season. It is a perennial, growing in small, dense clumps. It is not considered a very good grass for hay, but it is frequently cut and cured when standing with other grasses; but as a pasture grass it is probably the best of all native grasses. It is not easily tramped out and requires only a small amount of water. It grows rapidly and cures standing, and stock prefer it to almost any other rough food, even when dry.

Bouteloua polystachya (*six-weeks gramma*).—This is a common name applied to two species of the genus Bouteloua which are quite common and similar in character, and the two usually appear together. Both are annuals, and spring up in the open mesa just after the summer rains, and grow very rapidly, maturing in about six weeks. Under the influence of these grasses plains that were entirely bare will turn green and become valuable pasture land in a very short time. It is considered a very nutritious grass for stock.

Bouteloua eripoda (*woolly jointed gramma*).—This grass is also known as the "black gramma," and forms a large portion of the native forage of this district. It is somewhat different from the other perennial grammas in habit, growing more like the six-weeks grammas. It does not grow in bunches or clumps, but is rather diffuse. It gets the name of "woolly jointed gramma" from the fact that the internodes or "joints" of the stems are thickly covered with silvery white hairs. Late in the season the stems become dark colored, and from this it gets the name of "black gramma." The analysis of this grass indicates that it is not so good a food as most of the other grasses, since it is particularly poor in protein.

Bouteloua urtipundula (*tall gramma*).—The tall gramma, or "hairy mesquite grass," is perhaps the most widely distributed of any of the gramma grasses, being reported from nearly all of the States west of the Mississippi River and from several east of it. It is usually found on rocky hillsides and along the bases of the mountains, though it is not uncommon in the valleys and on the higher parts of the mountain ranges, having a vertical range of 3,000 or 4,000 feet. It cures as other native grasses do, and is considered a valuable feed by stockmen. Stock of all kinds eat it readily. It is frequently cut with other grasses by those who use and sell wild hay in this Territory. It has been recommended by good authority as an addition to the pasture grasses of Tennessee, and is said to be cultivated to some extent in the Southern States and to be much prized.

Eremochloe kingii Watson.—This is a small grass. It seems to be well fitted to the climatic conditions of high, dry, and hot plains. It produces a crop every season, no matter how little rain falls. Its nutritive ratio of 1 to 11.6 is much better than that of corn stover, and indicates that it may be a moderately good food. The plant is small and tough, and stock seem to eat it only when there is nothing else left. Its main value appears to be in the fact that it is almost sure to produce a crop when other grasses fail.

Distichlis spicata (*salt grass*).—This is the true salt grass (also known as alkaline grass), and it certainly deserves either name, since it forms a thick sod over these marshy, alkaline "flats" and "draws" which are of comparatively frequent occurrence in this western country. It grows well where alkali covers the surface of the land with a thick, white crust, provided there be sufficient water to supply its needs. It is cut in some localities, making a poor hay, but in this Territory, as far as is known, it is only used for a pasture grass. Animals eat it readily while it is green, but it should not be fed by itself.

These grasses are mentioned more fully because in many instances the newcomer in New Mexico is impressed by the apparently barren stretches of mesa which surround the valleys. He is told that stock raising is one of the principal industries of our Territory, and he immediately wonders where the food of all these cattle, sheep, and horses is obtained. But the dry, barren mesa produces much valuable forage, and, with the increase in numbers of the stock upon the range, the animals have acquired the habit of eating anything in the way of vegetable matter which is at all digestible or nutritious.

NEW MEXICO LIVE-STOCK INTERESTS FOR THE YEAR 1903.

By Hon. Will C. Barnes.

The present year will long be remembered by the stock growers of New Mexico. The early months of the year were hard ones on stock of all kinds. The winter months were very cold, with heavy snows during the month of February, which lay on the prairies and plains and in the canyons for many days, causing great loss, especially among the sheep herds.

The sheep took refuge from the storm in the washes and canyons, and in the lee of ledges, where the drifting snow curled over and soon buried them beneath its smothering weight.

Some cattle were lost in this way, and live stock of all kinds were greatly weakened by the snow covering the grass so they were deprived of food for many days. Spring, however, opened very auspiciously, and everyone rejoiced in the prospect of an early spring with its green grass for the early lambs and calves.

The prospect, however, did not materialize, and the spring was dry and extremely cold. The driest and coldest spring that New Mexico ever knew by all odds. All vegetation was fully a month late, and May 1 found the calf and lamb crop coming on and not a spear of green grass to feed them on. This caused a heavy loss, both in lambs and calves as well as the older stock. The prospect was indeed a gloomy one up to June 1, when dame nature, evidently ashamed of herself, poured out upon the thirsty earth a most opportune and timely flood of rain that lasted for fifteen days and left New Mexico from Raton on the north to Deming on the south a great, green meadow.

All stock rapidly fattened up, and while the losses had been severe, yet they were soon forgotten in the general prosperity that followed.

At the present writing, grass is generally good all over the Territory, and prospects for winter grass are entirely satisfactory from the stock raisers' standpoint.

In some parts of Grant and Luna counties rain would be acceptable; also in Colfax and Union; but still, taking the Territory over, feed is very good on all the ranges.

CALF AND LAMB CROP.

The lamb crop, in spite of the losses during the early part of the lambing season, proves to have been a very good one and is estimated at fully 75 per cent of a crop as against 85 per cent for last year. This means a tremendous increase in the sheep herds of the Territory and a consequent heavy shipment of New Mexican lambs during the fall and winter months. The prospects are that every lamb that is for sale will find a buyer at good prices, as the sheep buyers are already in the field, and New Mexico lambs will be shipped into the feeding lots of Colorado, Kansas, Nebraska, Missouri, and even Iowa and Illinois, for feeding for the early spring markets, as they have proved in the past to be the healthiest and most satisfactory animals for feeding that these feeders have bought.

The prices that lambs will bring this year have not yet been established, but it is doubtful if they will sell for any less than last year, when New Mexican lambs sold in the Kansas City market at a net price of $2.40 per head, according to the report of the Sheep Sanitary Board of the Territory.

It is hard to estimate the total lamb crop, but taking the figures furnished by the sheep board, of 4,200,000 head in the Territory previous to lambing, I believe it is safe to estimate this year's lamb crop at very close to the million mark.

As to prices for wool, the woolgrowers certainly have no cause to complain, as the average has been for this year about 15 cents, and some fleeces brought a cent and over more. This price bids fair to continue during the coming year, and at these figures a woolgrower can make big money on his wool alone and leave out entirely the matter of selling either mutton or lambs.

The calf crop for this year is light, probably, taking the Territory over, the percentage will not exceed 30, which, considering that the average is over 60 per cent, shows a decided falling off.

This decrease was discounted by the cow men some time ago, for it is a well-established fact that the year following a year when the cattle are poor in flesh is never a good one for the calf crop.

Last year cattle in New Mexico were poor, poorer than ever in the history of the business in the Territory, hence they failed to breed, and this year's calf crop is perforce a small one.

The smallness of the crop will, however, in a measure be equalized by the good quality of the calves, as they have had most excellent feed to grow on and will doubtless weigh considerably more than usual this fall.

HORSES.

New Mexico is gradually drifting back into horse breeding again, and, instead of the cayuse of the olden days, we find the best possible grade of blooded stallions being used and imported by the progressive stockmen of the Territory, and before many years we will be raising a superior class of horses both for driving and draft purposes.

ANGORA BUCK, SHOWING 18-INCH MOHAIR.

A FLOCK OF ANGORAS AFTER BEING SHORN BY MACHINERY.

SHEEP RAISING IN NEW MEXICO.

GOAT AND SHEEP RAISING IN NEW MEXICO.

The recent remarkable rise in horse values, especially good horses in the eastern markets, has been a stimulant to embarking in this industry, and, as said before, many stockmen have gone into it quite extensively, not as to numbers, however, but as to grade and quality.

While New Mexico grass will raise a good animal, no one should attempt to raise more horses than they can take care of during the winter months. The great mistake that was made years ago by horse breeders here, as well as all over the Western States, was that they depended altogether on the native grasses to grow their horses. Now, this is a poor plan, for to make a good horse requires good feed and constant feeding. No man can hope to raise a horse that will weigh 1,200 pounds upon 500 pounds of grass. The horse can and will do well during the summer months on the grasses alone, but in winter they should be kept growing by hay and grain rations, so that they are never at a standstill. The men who raise the horses for the eastern and foreign markets keep their horses growing from the day they are born, and, consequently, they attain a size and shape that bring the highest prices in the markets. New Mexico must raise fewer horses and better ones. To this end alfalfa is the king of feeds, and nowhere in the West can this wonderful forage plant be raised more satisfactorily than here with us. Supplement the grass in winter with liberal quantities of alfalfa and we will turn out horses the equal of any.

GOATS.

In the Angora goat New Mexico still leads the procession, there being more of them here than in any other State in the Union.

Lake Valley, in Sierra County, still remains the center of the industry, but other counties are growing large numbers of them, and it is constantly increasing all over our Territory.

CATTLE.

The prices for cattle this fall will be about those of last year. A large market for New Mexico cattle has been found in California, where heavy shipments have been made this summer and last spring to replenish the herds of that State, and it promises to be a good market for some time to come.

The ruling prices have been about $15 for yearlings, $18 for twos, and $21 and $22 for threes, with dry cows at $16. At these prices thousands have been shipped from Grant and Luna counties, while almost every county in the Territory has made shipments that way of greater or less extent.

This has kept that many off the eastern markets and will no doubt have considerable to do with making the fall markets much stronger than they otherwise would.

There are few aged steers in the Territory, and it would take a good deal of hunting to find a large shipment. There are plenty of twos and yearlings for sale and of good grade.

In the vicinity of Roswell several heavy outfits have sold their ranches and shipped their stock to Canada, looking for better grass. The venture, however, up to this time has not proved a very profitable one, and it is safe to say that they will sooner or later wish themselves back in New Mexico, with its equable climate and mild winters.

Meantime their ranges were purchased and occupied by cattlemen from Texas who moved in cattle from that State, and so in the end we were no poorer in taxable property.

RÉSUMÉ.

Summing up the conditions that prevail over the entire Territory, New Mexico stockmen are doing well. The live-stock industry is the one industry of the Territory. You can say what you please about the mines and those interests, but look over the tax rolls of New Mexico and you will find that the stock interests, the men who own the sheep and cattle of the Territory, are the men who pay the large part of the taxes and distribute more money among our inhabitants than any other business and industry.

Conditions as to feed for the coming winter are good. Stock should winter well in every district. Prices for stock of all sorts are good and the demand strong. While the year began badly, it is going to end in a very satisfactory way, and next year we predict a strong boom in values, especially cattle. The heavy losses all over the range country last winter, the light calf crop everywhere, and the heavy run of cows to the eastern packing houses during the past year must all tend to make a very decided shortage in cattle before long, which will begin to make itself felt about next spring, and consequently when any article begins to get scarce everybody wants to get some of it, hence an inevitable rise in values.

For the stock raiser New Mexico is the ideal place. Our animals are healthy, disease never troubles us, feed is fairly plenty, and they can be handled here at a minimum of expense. Add to this the pleasure of living in the most perfect climate under the skies, and the conditions are right from every standpoint.

EXPERIMENTS IN PUMPING FOR IRRIGATION CONDUCTED AT THE AGRICULTURAL EXPERIMENT STATION, MESILLA PARK, N. MEX.

By J. J. VERNON.

The results of the experimental work carried on during the past year at the Agricultural Experiment Station has been published in Bulletin No. 45, entitled "Pumping for Irrigation from Wells." This bulletin can be had free of charge by adressing the director of the Agricultural Experiment Station, at Mesilla Park, N. Mex. The experimental work, the results of which are set forth in this publication, had in view the following points:

(1) The development of water from the underflow in sufficient quantities for irrigation purposes;

(2) A test of pumps adapted to this line of work, and

(3) The determination of the relative value of different kinds of fuel.

The following summary taken from Bulletin No. 45 is a brief statement of the results obtained and conclusions drawn:

"SUMMARY.

"1. An ample quantity of water for irrigating purposes exists throughout the Rio Grande Valley in southern New Mexico at a comparatively shallow depth.

"2. This water, termed the underflow, can be easily made available by sinking pipe wells, with slotted strainers, into the gravel strata at comparatively low cost.

"3. The station at Mesilla Park sank an experimental well 6 inches in diameter and 48 feet deep from which was pumped a continuous stream of over 1,000 gallons a minute.

"4. From this well it was found possible, using a 20-horsepower steam engine with tornillo wood as fuel, to irrigate average land 3 inches deep at a maximum cost of from 51 cents to 64 cents an acre, according to the pump used. This estimate is for short runs; for long runs this cost will probably be reduced, a point to be determined later.

"5. Eight pumps of various types and sizes were tested by the station upon the well above referred to and comparative results are set forth in tabular form.

"6. A comparative test of four kinds of fuel was made and the results are compiled in tabular form.

"7. Data concerning pumping plants in New Mexico and other States have been collected and are compiled and presented in tabular form under the heads of wells, pumps, engines, lands irrigated, and railroad pumping plants.

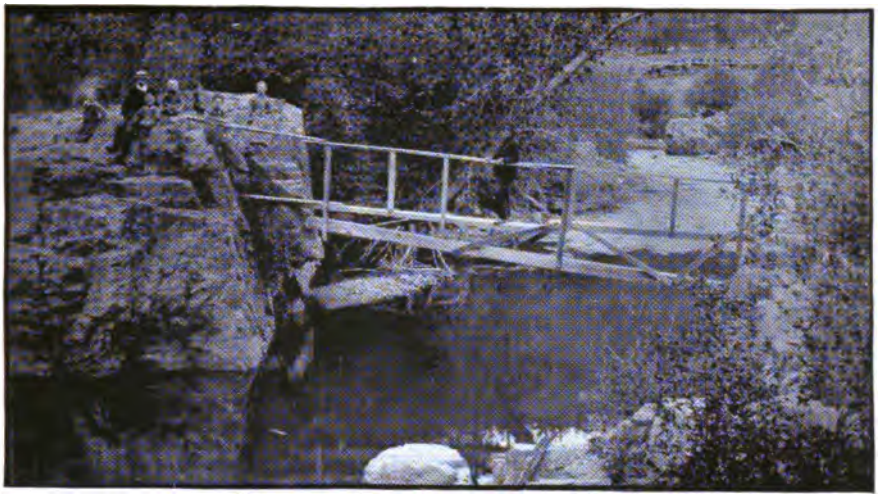
"8. A study of the relative conditions existing in New Mexico and other States shows that, in the Rio Grande Valley in southern New Mexico at least, the conditions are unusually favorable for the successful and economical operation of pumping plants as a means of supplying water for irrigating purposes."

The following extracts are taken from the same bulletin:

"DEVELOPMENT OF PUMPING PLANTS.

"Irrigation by pumping no doubt grew out of gravity systems. From irrigation by gravity it was only a step to that of pumping from river channels and canals to high-lying contiguous areas. In natural sequence pumping would follow upon lands lying slightly above gravity systems or upon areas having no water supply other than that of the underflow. * * *

"At the present time much greater areas are irrigated by pumping from wells than is generally supposed. King, in writing on this subject, says: 'It is further estimated for the whole Indian Peninsula, British and native, that no less than 300,000 shallow wells are in use, while they serve certainly more than 6,000,000 acres of land.' Large areas are being successfully irrigated by pumping from wells in the various sections of the United States, notably parts of the great rice region of the South, considerable areas of fruit lands in California, and certain alfalfa and fruit sections in Colorado and elsewhere.



NEAR THE POWER SITE OF THE CAPITAL LIGHT AND POWER COMPANY ON THE PECOS, NEAR SANTA FE.

A RESERVOIR SITE NEAR LAS VEGAS.

LAKE McMILLAN RESERVOIR, EDDY COUNTY.

"UNDERFLOW.

"When it comes to the matter of underflow the question is no uncertain one. Throughout the whole length of the valley (Mesilla) proper water will be found at a depth of from 4 or 5 feet to 20 or 30 feet, depending upon the height of the ground above the level of the river bed. This water appears to be generally of a good and fairly uniform quality throughout the valley, though near to the foothills the quality is an uncertain thing. In the matter of quantity it seems to be more a matter of providing means for making the water available than any question as to the underflow.

"THE STATION WELL.

"The experiment station well is 48 feet deep, and consists of an open well dug to water level, in the bottom of which is sunk a 6-inch pipe 21½ feet long, with a 12-foot strainer below the pipe, located in a water-bearing gravel stratum.

"STRAINER.

"The strainer used was 14 feet long, closed at the bottom, and made of No. 16 gauge galvanized iron, 12 feet of which was perforated with holes 1½ inches long and ¼ inch wide, the intervening spaces being of like dimensions. This type of strainer furnishes the largest safe amount of open space through which water can enter the well. The openings are sufficiently large to permit all the sand to enter the well and be pumped out, and at the same time small enough to restrain the gravel, thus forming a very porous water-bearing stratum. One or two feet of blank at the top of the strainer is important, so as to avoid possible danger of disconnecting the pipe and strainer."

In the following table a comparison is made between the solid contents of the water from the experimental well on the station farm and those found in the waters of two leading rivers of the Territory, the Rio Grande and the Pecos.

Analyses of water.

	Parts per 100,000.		
	Station well.	Rio Grande water from Acequia.	Pecos River.
Suspended matter	.....	831.4	179.6
Total solids	104.00	44.11	312.59
Lime, CaO	25.30	8.26	53.28
Magnesia, MgO	5.65	1.36	17.08
Soda, Na_2O	18.38	7.76	53.55
Potash, K_2O	2.13	0.94	2.65
Iron and aluminum, Fe_2O_3 Al_2O_3	0.00	1.85	0.93
Silica, SiO_2	2.50	.....	.....
Sulphates, SO_3	2.11	10.42	103.26
Chlorides, Cl	15.33	5.41	63.94
Carbonates, CO_2	9.90	5.06	3.19
Crystal water	26.16	4.27	29.16
Total	107.46	46.33	327.04
Oxygen equivalent of Cl (deduct)	3.46	1.22	14.45
Corrected total or total solids	104.00	44.11	312.59

The following tables give the detailed results of the experiments:

TABLE No. 1—*Comparative cost of a 3-inch irrigation, showing the cost of fuel per acre for irrigating 3 inches deep, using dry tornillo wood, at $2.25 per cord.*

Name of pump.	At most economic speed.	At 600 gallons per minute.	At 824 gallons per minute.	At 944 gallons per minute.	At 988 gallons per minute.
Van Wie	$0.512	$0.512	$0.539	$0.545	$0.760
R. D. Wood	.647	.647	.669	.708	.....
Kingsford	.597	.615	.597	.622	.909
Byron Jackson	.614	.720	.661	.614	.618
Fairbanks-Morse	.617	.675	.617	.655	.702

TABLE No. 2.—*Comparative test of fuel, showing the number of gallons pumped with 1 cord and 1 ton of fuel, using three kinds of wood and coal.*

Kind of fuel.	Weight of 1 cord.	Hours 1 cord ran 824 gallons per minute.	Hours 1 ton ran 824 gallons per minute.	Cost of 1 cord.	Cost of 1 ton.	Gallons 1 cord pumped.	Gallons 1 ton pumped.	Cost of pumping 100,000 gallons.
	Lbs.	*h. m.*	*h. m.*					
Medium cottonwood	2,218	5 49	5 14	$2.00	$1.80	287,576	258,736	$0.70
Small tornillo	1,968	6 0	6 5	2.25	2.29	296,640	300,760	.76
Large tornillo	2,830	8 0	5 39	2.50	1.76	395,520	279,336	.63
Coal (Gallup)	.....	.....	9 24	.....	6.00	.....	464,736	1.29

NOTE.—The above test was run with the R. D. Wood & Co horizontal centrifugal pump.

TABLE No. 3.—*Acres irrigated by varying quantities of water, showing the number of acres irrigated in one, ten, and twenty-four hours, pumping various quantities and irrigating various depths.*

Gallons pumped per minute.	Acres irrigated in one hour.						Acres irrigated in ten hours.						Acres irrigated in twenty-four hours.					
	1 inch deep.	2 inches deep.	3 inches deep.	4 inches deep.	5 inches deep.	6 inches deep.	1 inch deep.	2 inches deep.	3 inches deep.	4 inches deep.	5 inches deep.	6 inches deep.	1 inch deep.	2 inches deep.	3 inches deep.	4 inches deep.	5 inches deep.	6 inches deep.
600	1.3	0.6	0.4	0.3	0.2	0.2	13.2	6.6	4.4	3.3	2.6	2.2	31.8	15.9	10.6	7.9	6.3	5.3
824	1.8	.9	.6	.4	.3	.3	18.2	9.1	6	4.5	3.6	3	43.7	21.8	14.5	10.9	8.7	7.3
944	2.1	1	.7	.5	.4	.3	20.8	10.4	6.9	5.2	4.1	3.4	50	25	16.7	12.5	10	8.3
988	2.2	1.1	.7	.5	.4	.3	21.8	10.9	7.2	5.4	4.3	3.6	52.4	26.2	17.4	13.1	10.4	8.7
1,000	2.2	1.1	.7	.5	.4	.3	22.1	11	7.3	5.5	4.4	3.7	53	26.5	17.6	13.2	10.6	8.8
1,200	2.6	1.3	.9	.6	.5	.4	26.5	13.2	8.8	6.6	5.3	4.4	63.6	31.8	21.2	15.9	12.7	10.6
1,500	3.3	1.6	1.1	.8	.6	.5	33.1	16.5	11	8.2	6.6	5.5	79.5	39.7	26.5	19.9	15.9	13.2
2,000	4.4	2.2	1.4	1.1	.9	.7	44.2	22.1	14.7	11	8.8	7.3	106	53	35.3	20.5	21.2	17.6

NOTE.—In the above computation all fractions below 0.08 have been dropped.

TABLE No. 4.—*Size of farm irrigated by varying quantities of water, showing the acreage of land that can be irrigated by a given quantity of water (from 600 to 2,000 gallons per minute), pumping ten or twenty-four hours a day and irrigating every ten, fourteen, twenty-one, or thirty days.*

Gallons per minute.	Number hours run.	Irrigated every ten days.						Irrigated every fourteen days.					
		1 inch deep.	2 inches deep.	3 inches deep.	4 inches deep.	5 inches deep.	6 inches deep.	1 inch deep.	2 inches deep.	3 inches deep.	4 inches deep.	5 inches deep.	6 inches deep.
600	10	132	66	44	33	26	22	185	92	61	46	37	31
	24	318	159	106	79	63	53	445	222	148	111	89	74
824	10	182	91	60	45	36	30	256	127	85	63	51	42
	24	437	218	145	109	87	73	611	305	204	153	122	102
944	10	208	104	69	52	41	34	291	145	97	72	58	48
	24	500	250	167	125	100	83	700	350	233	175	140	116
988	10	218	109	72	54	43	36	305	152	101	76	61	51
	24	524	262	174	131	104	87	733	366	244	183	146	122
1,000	10	221	110	73	55	44	37	309	154	103	77	62	51
	24	530	265	176	132	106	88	742	371	247	185	148	123
1,200	10	265	132	88	66	53	44	371	185	123	92	74	62
	24	636	318	212	159	127	106	890	445	297	222	178	148
1,500	10	331	165	110	82	66	55	463	231	154	116	92	77
	24	795	397	265	198	159	132	1,113	556	371	278	222	185
2,000	10	442	221	147	110	88	73	618	309	206	154	123	103
	24	1,060	530	353	265	212	176	1,484	742	495	371	297	247

IRRIGATION WORKS.

FLOUR MILL AT SOCORRO.

TABLE No. 4.—*Size of farm irrigated by varying quantities of water, etc.*—Continued.

Gallons per minute.	Number hours run.	Irrigated every twenty-one days.						Irrigated every thirty days.					
		1 inch deep.	2 inches deep.	3 inches deep.	4 inches deep.	5 inches deep.	6 inches deep.	1 inch deep.	2 inches deep.	3 inches deep.	4 inches deep.	5 inches deep.	6 inches deep.
600	10	277	138	92	69	55	46	396	198	132	99	79	66
	24	668	334	222	167	133	111	954	477	318	238	191	159
824	10	382	191	127	95	76	63	546	273	182	136	109	91
	24	917	458	305	229	183	153	1,311	655	437	327	262	218
944	10	437	218	145	109	87	73	624	312	208	156	125	104
	24	1,050	525	350	262	210	175	1,500	750	500	375	300	250
988	10	458	229	152	114	91	76	654	327	218	163	131	109
	24	1,100	550	366	275	220	183	1,572	786	524	393	314	262
1,000	10	464	232	154	116	93	77	668	331	221	165	132	110
	24	1,113	556	371	278	222	185	1,590	795	530	397	318	265
1,200	10	556	278	185	139	111	92	795	397	265	198	159	132
	24	1,335	668	445	334	267	222	1,908	954	636	477	381	318
1,500	10	695	347	231	173	139	116	993	496	331	248	198	165
	24	1,669	834	556	417	334	278	2,385	1,193	795	596	477	397
2,000	10	928	464	309	232	185	154	1,325	662	441	331	265	221
	24	2,226	1,113	742	556	445	371	3,180	1,590	1,060	795	636	530

NOTE.—In the above computations all decimals below 0.8 have been dropped.

IRRIGATION IN NEW MEXICO.

When it is remembered that over one-third of the entire population of New Mexico lives on farms, and that agriculture, with the exception of in a few mountain valleys, can be carried on only by irrigation, it will be readily understood that the reclamation of the arid lands of the Territory by Government or private enterprise is the most vital question before the people of New Mexico to-day. Of the advantages and difficulties of agriculture and horticulture by irrigation the preceding pages speak in detail. When it is added that out of a total area of over 78,000,000 acres only about a quarter million of acres are in actual cultivation under irrigation ditches, then it will be seen that there is a vast opening for enterprise in reclaiming broad areas of as fertile lands as God ever created, lying under a perfect sky, and in a well-nigh perfect climate. Nor is there a lack of water for reclaiming at least a portion of the vast arid domain. The flood waters which flow to waste annually, the ordinary flow of rivers and streams that is wasted or not utilized, the tremendous underflow in most of the broad valleys of the Territory, the feasibility and cheapness of pumping water from unfailing wells in many sections, and the undoubted existence of large artesian belts all promise that sooner or later a great part of New Mexico will blossom like a garden.

Sufficient data have been gathered and published in the report of the Territorial commissioner of irrigation of 1898 and by the United States Geological Survey to make it quite feasible to pick out the most available reservoir sites and determine upon projects which at a minimum cost would benefit the greatest number of people.

At the present there are no large reservoir and irrigation enterprises under construction in New Mexico. During the past year in Eddy County, near Carlsbad, the large wooden flume of the Pecos Valley Irrigation Company has been replaced by an immense concrete flume across the Pecos River. An irrigation canal has been constructed for the Cochiti Pueblo Indians by the United States, enabling them to place a larger area under cultivation. The surveys and plans for a $100,000 irrigation system on the Zuni Indian reservation have been perfected and the necessary dams and canals are to be constructed during the next two years. The Government is building a ditch out of the San Juan River for the Navaho Reservation. It has been surveying a number of reservoir sites in the Territory and has withdrawn a considerable amount of public land from entry, excepting by homesteaders, preliminary, undoubtedly, to engaging in active work under the reclamation act recently passed by Congress. Private enterprise contemplates the erecting in the Rinconada Canyon, near Tularosa, Otero County, of a dam for the purpose of reclaiming 20,000 acres, and of utilizing the Cabresto River and Cabresto Lake, in Taos County, for an extensive

irrigation system. There is also in progress drilling for artesian water at Portales, Alamogordo, and other points, the last legislative assembly having appropriated funds for the drilling of an artesian well at the Territorial penitentiary at Santa Fe, and Congress for a similar well at the United Sates Indian school at Santa Fe. At Artesia, in Eddy County, artesian water has been struck in abundance and at no great depth, and the artesian belt of the Pecos Valley has been extended many miles. Quite a number of other irrigation enterprises, most of them on a small scale, are under contemplation, and the area of lands under ditch and well supplied with irrigation water is being gradually extended in every part of the Territory. As to the results of pumping from wells and the underflow a previous article speaks.

The following facts and figures are taken from the census report of 1900 on "Agriculture in New Mexico."

"New Mexico lies in the southern part of the Rocky Mountain area, well within the arid region, and embraces 122,460 square miles, or 78,374,400 acres. The Territory may properly be divided into three distinct regions—the eastern plains, the Rio Grande Valley, and the western plateaus. The eastern portion is an extension of the high plains of Texas, broken by the headwaters of the Canadian and Pecos rivers. This broad stretch of open grazing land continues to the uplands which form the southern extension of the Rocky Mountains of Colorado.

"This portion of the Territory is the paradise of cattlemen. Beyond this broken country is the Rio Grande Valley, and still farther west the elevated arid table-lands. These extend to the mountains, which lie about the headwaters of the Gila and Salt rivers. In the extreme northwestern part of the Territory, where lie the fertile valleys of the San Juan River and its tributaries, there has recently been a considerable development of irrigation.

"The Rio Grande, rising in southern Colorado, enters the Territory from the north through deep canyons. These widen in places, allowing room for bottom lands, and again the walls die down to low mesas. In the south, where many towns and agricultural communities are found, the proportion of lowland increases. Here the river tends to spread out over the bottom lands, losing the greater part of its water by evaporation or by diversion into ditches, and in the lower part of its course, above El Paso, the channel is frequently dry. In the Rio Grande section there are very few large irrigation canals, but many small community ditches supply lands held by the Indians and native settlers. The origin of these ditches is lost, even in local tradition, and it is probable that many of them were in use before the advent of the white race. The farmers in this valley, among whom those of mixed Spanish and Indian descent predominate, have followed traditional customs and show little energy or skill. Their lands are tilled in the most laborious fashion, largely by hand, and the returns are small.

"Under the community system each ditch is held and controlled by the owners of the land it irrigates, these living usually together in a village or pueblo. In the fall of each year a mayordomo is elected, who has full control of the ditch for the following season. He assesses the land for the labor necessary to clean the ditch and keep it in repair during the irrigation season, apportions the water to each consumer according to the local conditions, and in general supervises all matters pertaining to irrigation. While the apportionment of labor varies, it is generally such that a farmer holding a tract of 6 acres is required to furnish the labor of one man in cleaning and repairing the entire ditch in the spring, while he who holds 12 acres furnishes a man's labor whenever necessary during the whole season. The ditches have no regulating gates or sluices, and flooding is the only means of irrigation. Consequently, the use of water is extremely wasteful.

"The development of the agricultural resources of New Mexico depends largely upon the control of the Rio Grande. On the headwaters of this stream in Colorado are a number of canals of sufficient combined capacity to take all of the water. The seepage and inflow from small streams maintain the river to a moderate volume in northern New Mexico, but practically no water penetrates to the southern end of the Territory during the irrigation season. Sites suitable for reservoirs along the Rio Grande and its principal tributaries are numerous, and many of them excellent. Large dams constructed at these points would render it possible to hold great quantities of water for the irrigation of a number of open valleys along the course of the river. Some of these reservoir sites have been surveyed.

"Irrigation on the eastern plain is of comparatively recent introduction, but this region is destined soon to lead the rest of the Territory in the number of acres irrigated. The water supply is drawn from the Canadian and Pecos rivers. The Canadian River, rising on the eastern slope of the Rocky Mountains, flows through a valley 200 miles in length within the Territory. Irrigation ditches in this drainage basin are confined almost wholly to the tributaries, the course of the main stream being for the most part through a canyon, from which it does not emerge until it

passes the boundary. Important irrigation systems are supplied by the Cimarron, Vermejo, Mora, and Conchas rivers, those on the two first-mentioned streams being the most extensive in the Territory. Two large canals, constructed by a corporation, are located on the Maxwell grant, a tract containing 1,491,765 acres of grazing and agricultural lands, and including within its boundaries the headwaters of the Canadian, Vermejo, and Cimarron rivers. Along the line of these canals is a series of natural basins or ancient lake beds, favorably situated, in which large quantities of water are stored. Many smaller natural reservoir sites, located at elevations where evaporation is comparatively slight, are found near the headwaters of nearly all the streams which originate in this basin. Eleven reservoirs, with a combined capacity of 6,000 acre-feet,[a] have been constructed on the Vermejo. On the Cimarron there are 13 individual ditches and 1 corporation ditch. Connected with these are 4 storage reservoirs, with an aggregate capacity of 6,000 acre-feet. The area irrigated by the ditches of this stream is 7,629 acres. Mora River and its tributaries supply water for practically all the irrigation systems in Mora County. None of the normal flow of this stream reaches the Canadian River during the irrigating season, and there is a general scarcity of water throughout its entire drainage basin. The insufficient water supply has greatly retarded agricultural development and has caused the abandonment of many acres of valuable land. As a partial relief from these conditions two ditches have been built, by which, during the periods of greatest scarcity water is taken from the Rio del Pueblo in Taos County and diverted through passes in the mountains. All the ditches along the Mora and its tributaries are either private or community ditches, and the methods of management and distribution are those commonly found in all Mexican settlements.

"The Pecos River rises northeast of Santa Fe, in the northern part of the Territory, and first becomes a considerable stream at its confluence with the Gallinas near La Junta. As the river has mountain sources, the flow in the upper portion of its basin is perennial; but shortly after it emerges from the highlands much of its water is lost by seepage, and for several months in the year this part of the river bed is dry. In the lower part of its course in New Mexico the Pecos receives large quantities of water from numerous springs, which are a notable feature, many of them emerging from the earth with such volume and force as to prove beyond question that they come from the drainage waters of the high, precipitous mountain ranges on the west.

"The following are the principal tributaries of the Pecos, many of them furnishing a constant supply: Agua Negra, Agua Negra Chiquita, Rio Hondo, Berenda rivers (North, Middle, and South), the Spring rivers (North and South), Penasco, Seven Rivers, Rocky Arroyo, and Black rivers.

"The drainage area or catchment basin of the Pecos River lying within the Territory and available for irrigation purposes is estimated at 20,000 square miles. It extends across 4 degrees of latitude, with varying altitudes of from 3,000 to 11,000 feet. In the valley between Roswell and the Territorial line many of the lands subject to irrigation are of excellent quality, others are somewhat alkaline. A plentiful supply of water was reported in 1899 by all the irrigators on the upper portion of this river. In Leonard Wood County the only ditch reported as not receiving sufficient water is Las Colonias. This ditch, which covers 2,000 acres and in an average year waters 1,500 acres, irrigated only 98 acres in 1899. In Chaves and Eddy counties the water supply was sufficient for the land under ditch.

"In the western plateau region the total number of acres irrigated is small compared with the other two main divisions of the Territory. The waters affording supply for this region are the San Juan and its tributaries, the Gila, the Zuni, and the Mimbres rivers. The lands irrigated by the San Juan River are in the northern part of San Juan County. The sources of this river are in the San Juan and La Plata mountains in Colorado, and the affluents which it receives from the south are unimportant. Near the Colorado line the San Juan has a mean flow of about 960 cubic feet per second. This is augmented by the waters of the Rio de Los Pinos, which has an estimated flow of 80 cubic feet per second. The most important tributary is the Las Animas, which has a normal flow, at a point below Bloomington, of 855 cubic feet per second. The Rio La Plata, another tributary, has an estimated flow of 50 cubic feet per second.

"While the flow of all these streams is perennial, it fluctuates with the seasons, being increased by the melting snows in the spring, and later by the rains, which usually occur in the latter part of August and in September.

"In the drainage basin of the San Juan there are 52 ditches, located as follows: On the Las Animas 20 ditches, irrigating 7,132 acres; on the San Juan 19, irrigating 3,999 acres; and on the La Plata 13, irrigating 3,063 acres. The total area irrigated by the San Juan and its tributaries is 14,734 acres.

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[a] The acre-foot is an amount of water sufficient to cover 1 acre to a depth of 1 foot.

"The Gila River rises in the Black and Mimbres ranges and in Grant County flows for the most part through narrow mountain valleys. The total acreage irrigated by it is 5,933 acres. The flow is perennial, and only a small portion is used.

"In the northeastern part of Grant County a small acreage is irrigated by the Rio Mimbres. This stream flows southward as far as Deming, then turns abruptly to the east and discharges its waters upon the Florida plains, where they are lost in the sands.

"Between the basins of the Gila and San Juan rivers there is a small area drained by the Zuni River. Portions of this area are irrigated by the Zuni Indians.

"Of the 78,374,000 acres of land surface in New Mexico, only 5,130,878, or 6.5 per cent, were included in farms in 1899, and only 326,873, or 0.42 per cent, were improved. Of the improved land, 303,438 acres are located outside of the Indian reservations. The importance of irrigation is demonstrated by the fact that in 1899 the irrigated area outside of the Indian reservations was 203,893 acres, or 67.2 per cent of the improved land. In 1889 the corresponding irrigated area was but 91,745 acres. By the building of new ditches and the extension of old ones the irrigated area of the territory has been augmented 112,148 acres, a net increase of 122.2 per cent.

"Of the farms of the Territory, 72.2 per cent were wholly or partially irrigated in 1899, while of the improved acreage 67.2 per cent was irrigated. The average area of improved land in each irrigated farm was 33 acres, of which 26 were irrigated.

"The average number of acres of irrigated land for each mile of ditch reported is 86. The area under ditch for each mile is 272 acres, or over three times the average irrigated area. In many States where there is a larger percentage of new irrigation enterprises than in this Territory the area irrigated bears a much smaller ratio to the area under ditch. In the sections of New Mexico where irrigation has been practiced for centuries the effect on the old canals of the diversion of water at points farther up the streams is shown by the difference between acreage under ditch and acreage actually irrigated. This is especially evident along the Rio Grande. On the other hand, in the valleys of the Pecos and San Juan rivers and their tributaries, the difference is due to the presence of new enterprises which have not been sufficiently developed to furnish water to all the land under them. In the newer districts this difference indicates that an increase in the irrigated area is possible. In the older districts further development without water storage is unlikely.

"The average cost of constructing the ditches was $1,738 per mile, and $6.40 per acre of land under ditch.

"Of the 12,311 farms in the Territory, including those in Indian reservations, 9,128 are irrigated and 3,183 are unirrigated. The acres in the irrigated farms number 2,892,855; in the unirrigated, 2,238,023. The value of all land in the irrigated farms, not including buildings, is $13,551,592, and in the unirrigated, $3,772,117. The value of all buildings on irrigated farms is $2,775,532, and on the unirrigated, $789,573. Live stock on the irrigated farms has a value of $15,785,760, and on the unirrigated, $15,941,640. Irrigated farms are, in number, 74.1 per cent of the total for the Territory; in acreage, 56.4; in value of land and improvements, exclusive of buildings, 78.2; in buildings, 77.8; in implements and machinery, 75.9; in live stock, 49.7; and in total farm wealth, 64.5.

"The average size of all farms, exclusive of those held by Indians, is 464 acres, and that of irrigated farms, 360 acres. The average area of irrigated land in each irrigated farm is 26 acres. For farms making use of irrigation the average value of products not fed to live stock is $2.13 per acre. The unirrigated farms make greater use of the public domain for grazing purposes than do those which are irrigated, and an income is thus secured in addition to that obtained directly from the land owned and leased. In the unirrigated districts large areas of public land are fenced by cattlemen, although the title rests wholly with the Government. Nevertheless, for unirrigated farms the average value per acre of products not fed to live stock is only $1.79.

"The average value per acre for irrigated land is $29.26, while that for the best irrigated alfalfa land is from $50 to $100 per acre. The value of irrigated fruit land frequently runs as high as $400 per acre, and occasionally reaches $500."

CLIMATE AND CONSUMPTION.

By Dr. Francis Crosson.

Tuberculosis (consumption) is the most widely spread and general disease afflicting mankind, and it is distributed over a larger portion of the earth's surface than any other disease of which we have an absolute knowledge. No race of people, no por-

tion of the habitable globe, can be said to be absolutely invulnerable against its invasions and destructive ravages. It is a disease so old that we have no reliable history extant, telling us when and where it first appeared among the human race. Every age has brought forward its supposed panacea in an attempt to stay its mortal march. In spite, however, of everything that has thus far been devised or suggested for the prevention or cure of this alarmingly fatal malady it may be said, in a general way, that we are still in the very infancy of our power to stay the onward progress of this arch enemy of mankind.

Since the announcement by Robert Koch, of Berlin, in 1882, of the specific causative factor of tuberculosis (the so-called bacillus of tuberculosis), practically nothing has been accomplished in either limiting or preventing the spread of the disease. Numberless remedies and alleged specifics have been heralded to the world from time to time; each has had its brief day of trial and failure, so that at the present moment it can be affirmed with great certainty that we stand practically as powerless to deal successfully, in a medical way, at least, with tuberculosis as did the fathers of medicine centuries ago.

The treatment, prevention, and cure of tuberculosis have been, more or less prominently, subjects of discussion in both the newspaper press and periodical publications of the past few years. The public has been partially taken into the confidence of the medical profession. Educational and missionary literature have been freely disseminated by societies for the prevention of tuberculosis, with the hope of familiarizing the reading public in some degree with the history, nature, and progress of a disease alarmingly fatal in its tendency when left unhindered to pursue its usual course. In spite, however, of these laudable efforts to educate individuals and create sentiment among public officials and legislators, the fact is quite patent to persons conversant with this subject that there is a widespread misconception and misunderstanding concerning a disease which is alleged to be the cause of one-seventh of all the deaths occurring annually in the United States alone.

It has been stated by some writers that tuberculosis can be successfully treated in any climate. All experience, I believe, is against such a conclusion. It has been demonstrated beyond question that certain sections of the United States possess climatic characteristics which are peculiarly adapted to the successful management of this disease. The so-called arid region of the great Southwest, which comprises portions of southern Colorado, all of New Mexico and Arizona, together with that part of western Texas known as "Llano Estacado." or "Staked Plains," may be included in this favored section. This vast and salubrious stretch of country, which is sometimes sneeringly alluded to as "a land of sand, sagebrush, and cacti," possesses in an almost illimitable degree those very elements which observation and experience have proved to be of the utmost value in the treatment of tuberculosis.

We are gradually getting away from the laboratory and drawing closer to nature for a solution of this problem. Where medicines have failed the elements are succeeding. A pure atmosphere, containing an abundance of oxygen, ozone, and electricity, in conjunction with a large amount of sunshine, is to-day fulfilling in an eminently satisfactory manner the mission heretofore mapped out for such agents as cod-liver oil, creosote, and the various poisonous concoctions known as serums.

The importance of climate as a factor in the treatment of pulmonary tuberculosis is daily manifesting more and more its value, whether taken separately, or coupled with the various specific plans of therapy now advocated and employed in this important branch of practice. Physicians are informing themselves more widely upon this vital question, and the experiences gained by the practitioner living amidst such ideal climatic conditions as exist in New Mexico and other parts of the great Southwest, are being looked upon with more interest and kindly consideration than has heretofore been accorded them.

The consensus of opinion as expressed by the leading authorities on tuberculosis at the International Congresses held at Moscow, Russia, two years ago, and later at London, England, and Madrid, Spain, was unanimously in favor of the climatic treatment of pulmonary tuberculosis over all other methods considered.

The southwestern section of the United States is studded all over with tubercular patients, who came to this section long ago—some of them as long as twenty-five years. They are to-day, and have been for many years, healthy citizens, have married and reared children who are to all appearances absolutely free from tubercular diseases.

Such a thing as infection with the tubercle bacillus, through the medium of the atmosphere, is absolutely unknown in New Mexico. I have taken great pains to investigate this subject. An atmosphere where dead and discarded animal and vegetable substances undergo desiccation rather than decomposition explains, in a manner, the curative effect of climate upon pulmonary tuberculosis. The native people of New Mexico are singularly free from tuberculosis. I have have had but

three cases in a general practice among them covering a period of more than ten years. In each of these instances I was able to trace the origin of the disease to a direct infection.

Animals, as well as the human race, are likewise remarkably free from tuberculosis in this region, as has been shown by the researches of Herrera and Lope in Mexico, where the climatic conditions are practically similar to those existing in New Mexico, Arizona, southern Colorado, and portions of western Texas.

These investigators report that they found but 45 cases of tuberculosis in cattle out of 73,000 killed and examined at the Government abattoir in the City of Mexico.

It may be stated in a general way that all specific plans of therapeutic treatment thus far suggested for the cure of tuberculosis, and especially of the pulmonary form, have failed, so that we must look to nature rather than to the laboratory for our weapons to combat this enemy of the race.

In my experience, the best possible treatment for incipient pulmonary tuberculosis is the nomadic life of the tent-dweller in a climate such as we have here in New Mexico, where the patient can live out of doors practically all the year around. I have had many patients recover under this plan of treatment.

The early diagnosis of pulmonary tuberculosis is of the utmost importance, for it is in the beginning of the disease that we must look for the greatest benefit in the largest proportion of cases from the climate or the out-of-door plan of treatment.

New Mexico is essentially a "land of sunshine and blue skies."

Here we have a dry and bracing climate, with no extreme heat or cold, a climate which, for the most part, admits of an existence out of doors almost all the year round. It is these qualities of air and sky that have caused this favored region to be known to-day over the entire civilized world as the "Land of Sunshine." The peculiar adaptability of such a climate to the successful management of consumption and other diseases of the lungs and respiratory tract is causing invalids to flock here in great numbers, experience and observation having demonstrated beyond further question the fact that the sea-coast resorts have proved dismal failures in exercising either a corrective or retarding influence upon the diseases mentioned above.

The past few years the medical profession, as well as the laity, have been made aware, through various channels, of the vastly superior climatic conditions existing throughout the Territory of New Mexico, and patients are seeking relief here by the hundreds where formerly we could estimate them only by the dozen.

I am not conversant with all of New Mexico's superior resources, but I am persuaded that chiefest among her items of wealth is her grand, glorious, life-giving climate.

In their pursuit of the germ of consumption investigators seem to be losing sight of the patient afflicted with this disease. Boards of health are suggesting all sorts of safeguards to limit the spread of consumption in the large and populous centers. Warfare against infected meat, milk, birds, and domestic animals is being waged with interminable energy, in the hope of eradicating from the human race a disease that has baffled our best scientific minds for centuries.

So fierce and vindictive has this campaign become that at least one State—California—has threatened to establish and maintain a quarantine of exclusion against consumptive patients seeking residence or sojourn within the borders of that State. This is certainly carrying prophylaxis to an unreasonable extreme. To attempt to put into force such a drastic measure would surely raise serious questions concerning the rights of States as against those of individuals. Further than this, the adoption of such a silly piece of legislation would carry with it the implication that tuberculosis or consumption is a menace to the population in the same sense that smallpox, diphtheria, and scarlet fever are menances. This we know to be absurd. If tuberculosis is ever communicated from one person to another by direct contact, personal association, or even through the medium of the atmosphere, it is the very unusual exception and not the rule. To prove this statement we have merely to refer to the records of hospitals and sanitariums exclusively devoted to the treatment and care of persons afflicted with tuberculosis. I doubt if there can be found among these records a single well-authenticated case of the disease ever having been transmitted from the diseased to the healthy even after years of daily personal contact. Instances are recorded occasionally where nurses and attendants have been directly inoculated or infected through cuts and abrasions on the hands while handling cuspidors and other receptacles while in the act of disposing of the infectious discharges from the diseased lungs. It is likewise true that various domestic animals and birds have tuberculosis, and in some instances they may be sources of danger to the human race. Many serious charges have been made against milk as a vehicle for conveying the germs of this disease into our bodies, but how many authenticated cases of the disease can be traced to such agents and sources?

Osler says: "The requirements of a suitable climate are a pure atmosphere, an equable temperature not subject to rapid variations, and a maximum amount of sunshine." Given these factors, and it makes little difference where a patient goes, so long as he lives an outdoor life. The purity of the atmosphere is the first consideration, and it is this requirement that is met so well in the mountains and the forests.

No medical agents have any special or peculiar action upon tubercular processes. The influences which they exert are upon the general health, increasing the physiological resistance and rendering the tissues less susceptible to invasion.

The problem of the prevention of the further spread of tuberculosis and its ultimate and complete eradication from the human race will be solved when physicians realize the importance of at once placing the patient suffering from, or threatened with, this disease in a suitable climate. Children inheriting that peculiar condition of the cellular structure and cell elements known as a tubercular tendency will develop, in a favorable climate, a cell antagonism to the disease which can never be acquired in a climate where tubercular diseases are more common and one which favors the causes that lead to tubercular disease.

One of the most pathetic aspects of this disease is the fact that it has in the past, and still continues to number among many of its victims, many of the brightest and brainiest products of the human race. This fact seems doubly deplorable when it can be shown that many, if not all, of these useful lives could have been saved by a timely recourse to the climatic plan of treatment.

It is generally conceded by the most eminent writers upon bacteriology to-day that climatic conditions play a most conspicuous part in both development and retardation of microbic life. Epidemic diseases which have for their vehicles of distribution certain conditions of atmosphere, such as heat and moisture, constantly demonstrate their power of spreading contagion, the moisture contained in the air being the chief factor for preserving the vitality of the germ.

To anyone familiar with the extreme differences existing along the Atlantic Coast States and here in the Southwest, the great rôle played by the climate in each locality named, will at once become strikingly apparent to the most indifferent observer. Epidemics (such as la grippe), so fatal and destructive in their train of sequelæ, are unknown in New Mexico. This is rather remarkable, in view of the fact that the bulk of the population (about three-fourths) are native people, who live in the most humble and primitive state, never employing any modern sanitary precautions to guard against epidemic invasions. After careful experiments and close observations for more than ten years, I am persuaded that the climatic conditions existing throughout the Territory of New Mexico, and in the mountain regions more especially, the rarity and purity of the atmosphere, together with the almost constant direct rays of the sun, are the most powerful bactericides known to science to-day. A climate where discarded animal and vegetable substances undergo prompt and rapid desiccation after brief exposure to the atmosphere without the least manifestation of decomposition argue most strongly against bacterial development. I have repeatedly made experiments with the discarded sputa from tuberculous lungs, and I find that the bacilli lose their infective power in a very short time after exposure to the sun's rays in this arid atmosphere. This, I think, clearly explains the curative effect of climate upon pulmonary tuberculosis. Constant inhalation of what may properly be termed an aseptic atmosphere in time brings about in the pulmonary tissues, inflamed by tuberculous deposits, that very desiccation effected upon animal and vegetable substances exposed directly to the air.

Here in New Mexico, where we constantly have a large colony of invalids, principally persons with tuberculosis, I have yet to meet with a single case of tuberculosis communicated from the diseased to the healthy through the medium of the atmosphere. That the native people of this section, both Mexican and Indian, experience such wonderful immunity from tuberculosis, especially of the respiratory tract, must have its explanation in the very favorable climatic conditions surrounding.

In order to derive all the possible benefit from such a climate as that of New Mexico the health seeker should live out of doors. If he has the strength to get about at all, the best he can do is to go into the pine forests and camp out. The nomadic life of the tent dweller is the best treatment for incipient pulmonary tuberculosis. It is often a grave mistake for an invalid to seek change of climate in a place where he has no friends, no occupation—nothing to distract his mind from himself and his malady. In a few days he exhausts the possibilities of mere curious interest in unfamiliar surroundings, and then he strolls about alone or with chance acquaintances until he becomes weary of the town and the monotony of his existence. Homesickness ensues, the mental disease more than counterbalances the climatic benefit, and the health seeker in desperation returns to his home, preferring the certainty of death among friends to the possibility of a prolonged existence under insupportable

conditions. If such a health seeker would procure a saddle horse, pack animals, and a camp outfit and go into the mountains with a good guide and agreeable companions he would find no monotony and no homesickness, but would gain strength and buoyancy of spirit and never know a dull hour. A year of out-of-door life in the dry, bracing air of New Mexico will, I believe, arrest any case of beginning pulmonary tuberculosis, if the sufferer has the necessary strength and vitality to begin such a course of treatment and takes ordinary precautions against undue exposure and overexertion.

In a period of ten years I have observed not so much the contrast as the very striking results following the use of specific plans of therapy as compared with the influence of climate upon diseases of the respiratory system in general, but with more especial reference to pulmonary tuberculosis. And I must declare in the most candid terms that any alleged specific employed or indicated in this class of affections will have its efficiency overwhelmingly augmented if suitable climatic conditions have a proportionate consideration with the medical agencies employed.

Recognizing the superior climatic advantages of New Mexico for the treatment of diseases of the respiratory system, the United States Government has recently established, and has now in successful operation, two large sanitariums here, one operated under the auspices of the War Department and the other under the Marine-Hospital Service. A third sanitarium, for the Navy proper, is now in contemplation and doubtless will soon be in process of construction.

This action of the Government in establishing its three great sanitariums for the treatment of consumption in New Mexico is a far greater and stronger eulogy on the climatic advantages af this Territory than anything that can be said or written upon the subject.

Since the establishment five years ago of the two Government sanitariums—one at Fort Bayard and the other at Fort Stanton—several hundred soldiers and sailors with tuberculosis have been cured by the climatic treatment, which is the chief feature at both of these establishments. Liberal appropriations have been made by the Federal Government for enlarging and improving both of these institutions, and they are destined to make a record in the future by the large and increasing per cent of cures they are effecting. Fresh air in abundance, both night and day, is the first and most important factor in the treatment. Coupled with this is a healthful, abundant, and varied dietary, rest, moderate exercise, amusements, and recreations of a suitable character. These constitute the plan followed at both places, and they are proving each day the immense advantages they possess over the old methods of treatment.

Private sanitariums are rapidly springing up all over New Mexico, and this is a positive indication that at last capitalists as well as scientific men are beginning to admit in a practical way that the future of New Mexico has great possibilities in this respect.

At Silver City, Las Cruces, Las Vegas, Santa Fe, and other points throughout the Territory are now in successful operation excellent sanitariums conducted by private individuals. If we add to these the various mountain resorts and springs where camp life is a feature, it will be seen that at the present time much excellent provision is already made for health seekers coming here, whereas, only a few years ago, everything of this kind was extremely crude. Special attention is given at all these places to making the dietary varied and wholesome. This, with abundant sunshine and pure mountain spring water, constitutes a trinity hard to surpass in the treatment of consumption.

"Sunmount," beautifully situated in the foothills east and south of Santa Fe, is the pioneer tent city of this region and the most important. Great care in the selection of the site has repaid the owners, as the demand for accommodations increases daily.

The "Holmes sanitary tent" is in use here, and its construction is so ideal for the purpose that it permits of a comfortable life in the open air during the entire year.

Beautiful scenery, constant sunshine, pure water from mountain springs, a generous cuisine, competent medical supervision, trees with health-giving properties, like the spruce, cedar, pine, and the Australian red-gum eucalyptus, together with the altitude of 7,000 feet, and the pure mountain air form an ideal combination of health and life-giving elements not to be found elsewhere, perhaps, on the continent. "Sunmount" is surely destined to become one of the most noted health and pleasure resorts in the entire southwestern country.

A common mistake about this country is that it is a very expensive place to live in. At "Sunmount" excellent tents are to be had at $10 and $15 per month.

Various amusements, suited to the necessities of health seekers, are provided, and an automobile line will also soon be in operation.

The Chico Springs Sanitarium, in northern New Mexico, is beautifully situated at the base of the Raton Range of the Rockies, and affords ideal conditions for the successful management and treatment of cases of consumption, in the early stage especially. Every provision is made here for the comfort of guests, and the climate is beautiful all the year round. Horseback riding, hunting, fishing, golf, and other healthful out-of-door recreations are provided, and the cuisine is bountiful and varied. Doctor Masten, who conducts the Chico Springs Sanitarium, gives his personal supervision to each case, and patients coming to this ideal resort are assured in advance of thorough, up-to-date methods.

Chico Springs is reached by a pleasant stage ride, some 20 miles from Maxwell City, on the main line of the Santa Fe route. Comfortable tents are provided for such as desire tent life, an existence that is perfectly ideal here in New Mexico, where the sun shines on an average of three hundred and fifty days in the year.

GEOLOGICAL FORMATIONS OF NEW MEXICO.

By CHARLES R. KEYES,
New Mexico School of Mines.

GENERAL STATEMENT.

Of late years much has been learned regarding the geological formations of New Mexico and the mineral deposits which they contain. So far have the investigations already progressed that the materials are now nearly sufficient for preparing a geological map of the region.

The importance of being able to recognize the geological formations is of great economic value. Most kinds of ore deposits, for example, are characteristic of certain geological formations, and it is useless to look for them elsewhere. When this fact comes to be thoroughly appreciated by the people at large, more than two-thirds of the useless prospecting for mineral wealth will be eliminated. A like amount of effort can then be directed along more productive lines.

From both a mining and a purely scientific view point the rocks of New Mexico are of exceptional interest. The wide range of geological formations represented, the large and diversified deposits of ores and other mineral values which these formations are known to contain, and the fact that the mineral wealth of the region has as yet been barely scratched at the surface all go to make New Mexico an interesting field to the miner.

The geological formations of New Mexico comprise five very marked classes of rock materials. At the base is a great mass of crystallines, chiefly granites, gneisses, and schists, with some metamorphic clastics which can not always be directly distinguished from the members of the fundamental complex. These are Archean and Algonkian in age. The later Paleozoics are widely distributed and are chiefly known by the thick blue limestones which form the crests and back slopes of many of the principal mountain ranges; these are Carboniferous. A third class of rocks is found in the thick and extensive beds of massive yellow sandstones, the geological age of which is Cretaceous. Over all these indurated rocks is a mantle of soft clays and sands largely deposited during the Tertiary. Later than all of these are vast outflows of igneous rocks, which cover many thousands of square miles within the limits of New Mexico. The period during which these volcanic rocks were erupted extended from the late Tertiary down probably to within the time of the settlement of America by Europeans.

ARCHEAN BASEMENT.

In recent years our ideas regarding the crystalline basement of the great sedimentary sequence in the New Mexico area have undergone very radical changes. Most of the extensive formations composed of granites, schists, gneisses, and slates which form the core of so many of the mountain ranges are now thought to be of later geological age than what is now generally understood by the term Archean.

Only in the southern extremity of the Sangre de Cristo Range is it thought that true Archean rocks are exposed. Possibly also some of the basement crystallines of the Mogollon and Burro mountains, in western New Mexico, and in the Sierra de los Caballos, in south central New Mexico, may finally prove to be of Archean age. Even in these localities the areas, which may be properly referred to the Archean are quite limited in extent.

ALGONKIAN SCHISTS.

Most of the mountain ranges of New Mexico are great tilted blocks, having one long sloping side, and one steep face, originally a fault scarp. In the abruptly rising face a considerable portion of the basal part is often found to be made up of quartz plates, micaceous and hornblendic schists, gneisses, and granites. The foliation of these highly metamorphosed rocks is usually nearly vertical. Where they meet the basal quartzites and limestones above they are sharply beveled off and the stratification of the last-named beds is nearly at right angles to the planes of lamination beneath.

For a long time it was thought that this crystalline complex represented the Archean. Late investigation has shown conclusively that many so-called quartz veins are in reality quartzites. Under the microscope, in thin section, these great white quartz plates are clearly clastic in origin. Many of the dark-colored schists were without doubt basic intrusives, and some of the gneisses are manifestly old sheared granites. These masses are frequently seen to be penetrated by later acid eruptives forming various irregular masses and sheets of red granite.

These highly metamorphosed masses are here referred to the Algonkian age. They are more or less mineralized in the various mountain systems. They contain many of the extensive deposits of copper, iron, silver, gold, and some of the rarer metals.

These rocks are well displayed in the Sandia, Manzano, San Andreas, Magdalena, Caballos, Black, Sangre de Cristo, Sacramento, and other ranges.

The Algonkian or pre-Cambrian clastics of the Grand Canyon sections are not recognizable anywhere in New Mexico so far as concerns the subdivisions there distinguished. It is quite possible that more detailed study of the New Mexican field will disclose the relationships to the Grand Canyon section. The main succession there is as follows: (1) Vishnu quartzite at the base; (2) Grand Canyon sandstones, with interbedded and cutting basic eruptives; and (3) Chuar shales and limestones.

LOWER PALEOZOIC FORMATIONS.

At present there is no reliable evidence that any of the Lower Paleozoic beds are represented within the limits of New Mexico. The great Cambrian, Silurian, Ordovician, and Devonian systems which are so extensively developed in other parts of the American continent have thus far failed to be observed in the southern Rocky Mountain region.

The Cambrian formation, Tonto series, so well developed in the Grand Canyon district, may be represented in western New Mexico in some of the massive indurated sandstones. In central New Mexico, in the Sandia, Caballos, and San Andreas ranges, there is a massive quartzite, 50 to 100 feet in thickness, the lower part of which is a conglomerate, lying between the Carboniferous limestone and the metamorphics. It is conformable with the limestones immediately above it. This quartzite member reposes upon the upturned edges of the Algonkian formations, indicating clearly that an enormous erosion interval separates the two. It would not be surprising if this erosion plane represents all Lower Paleozoic sedimentation in other parts of the country. In some mountain ranges this quartzite carries important copper deposits.

It was once believed that the formations subjacent to the great Carboniferous limestone were the metamorphosed beds of the Lower Paleozoic, but this hypothesis has been found to have no foundation.

CARBONIFEROUS.

The Carboniferous system appears to be the only part of the great Paleozoic sequence that is represented in New Mexico by deposition. With the standard Carboniferous section for the American continent, as represented in the Mississippi Valley, the New Mexican sections admit of little detailed comparison.

On the whole, the Carboniferous rocks of New Mexico are very important formations. They are found in the majority of the principal mountain ranges. In most localities they are important ore carriers. As guide horizons they deserve the fullest consideration in the location of mines.

Four important series of formations belonging to the Carboniferous system have been clearly made out in New Mexico. They represent the Lower Carboniferous, the Middle Carboniferous, the Upper Carboniferous, and Oklahoman series. The

three series of Coal Measures composing the Middle Carboniferous and so enormously developed in the Mississippi Valley have not been distinguished in the West. They are doubtless represented by limestones.

LOWER CARBONIFEROUS.

The nether series of the Carboniferous has been clearly differentiated in New Mexico in a number of localities. Principal of these places is Lake Valley, in Sierra County. Here have been found extensive limestones carrying the fauna of the Lower Burlington limestone of Missouri, Iowa, and Illinois. To this remarkable limestone the local geographic name of the Lake Valley appears appropriate.

In the Sacramento Mountains the faunal equivalent of the Burlington limestone of the Mississippi Valley also is well exposed.

MIDDLE CARBONIFEROUS.

The great limestone plates which cap the principal mountain ranges in central New Mexico, and which form their back slopes, are Carboniferous in age. Immediately beneath the great limestone formations is found, usually, a white quartzite, which often passes downward into a coarse conglomerate. The quartzite, with its coarse phase, rests unconformably on the upturned edges of the metamorphic series.

The great limestones are easily distinguishable by their black and blue to gray color, their peculiar compact texture, and the fossils which they contain. The thickness of the limestone is from 300 to probably 1,000 feet. It is massively bedded, and in some localities contains some very thick beds of very pure whitish lime rock.

This great limestone formation forms a remarkable cornice on the Sandia Mountains, clearly seen from the railroad station at Albuquerque. It is also an important part of the Manzano, Magdalena, Socorro, Caballos, Ladrones, San Andreas, and Sacramento ranges.

In most of the districts the Carboniferous limestone carries important lead and silver deposits. The quartzite also carries copper.

In the Sandia Mountains the several formations have been more clearly differentiated than perhaps anywhere else. The basal conglomerate and associate sandstones have been called the Sandia quartzites. For the lower black limestone the name Placitos is proposed. According to the best available evidence derived from the contained fossils these beds correspond to the Coal Measures of the Mississippi Valley.

UPPER CARBONIFEROUS.

The superior part of the great limestone formation—the blue to gray beds—contains an abundant fauna that clearly points to an age of late Carboniferous. In the Sandia Mountains this formation is called the Madera limestone. It forms by far the most important portion of the Carboniferous in all of the ranges before mentioned.

PERMO-CARBONIFEROUS.

Above the great blue limestones of the Carboniferous comes in an important sandstone, and then a sequence of shales and sandstones conspicuous for their remarkable red coloration. "Red beds" they are generally called. These red beds are followed by other red beds, but the latter are believed to belong, not to the Carboniferous, but to the Jura-Trias.

These Permo-Carboniferous red beds are found everywhere at the foot of the back slope of the central New Mexican mountain ranges. They are 200 to 1,000 feet thick and often form a conspicuous feature in the landscape.

In the Sandia Mountains the lower sandstone is called the Coyote sandstone—from Coyote Springs—and the upper member of the Bernalillo shales.

These red sandstones and shales are notable for the copper ores everywhere distributed through them, in amounts, however, usually too small to be commercially valuable.

JURA-TRIAS.

There appears to be small doubt that the upper part of the great formation, long called the "red beds," belongs to a later geological age than the Carboniferous.

American geologists prefer to denominate the lower part of the threefold Mesozoic the Jura-Trias. The particular portion which appears to be represented in New Mexico is what in Kansas is termed the Cimarron series.

In New Mexico these beds are largely developed in the northeastern part in the Cimarron, Canadian, and Pecos valleys, and in the central part in the Rio Grande Valley. In thickness the measurement is probably greatly in excess of 500 feet.

The important ore deposits are chiefly those of copper and iron. Gypsum, fine clays, and cement materials abound.

CRETACEOUS.

The Cretaceous formations are the most extensive surface rocks in New Mexico. They probably cover more than one-half of the whole area. Both the Upper and Lower Cretaceous sediments are well represented.

Comanche series.—In the Canadian and Pecos valleys, particularly around the western and northern borders of the Llano Estacado, there lies above the "red beds" a remarkable sequence of sands, chalky rocks, and clays. These have been called the Trinity sands at the base, the Fredericksburg limestone, and the Washita sands.

Dakota series.—At the base of the Upper Cretaceous is a thick sandstone at least 300 feet in thickness. This is one of the chief artesian water reservoirs. While not generally recognized in New Mexico in any parts other than the northeastern, it is probably widely distributed, and is to be found short distances above the "red beds."

Colorado series.—In northeastern New Mexico in particular the Colorado formation is well defined. It there attains a thickness of fully 800 feet. It comprises chiefly shales with numerous bands of limestone and several thick sandstones.

Montana series.—Attaining a development of 1,500 feet in northeastern New Mexico, the Montana is well represented by at least two important terranes, known farther north as the Pierre shales and the Fox Hills sandstones. The shales are prevailingly gray and drab, becoming yellowish above and blackish below.

Important beds for the manufacture of Portland cement are found in the formation.

Laramie series.—In New Mexico the beds generally referred to the Laramie are upward of 2,000 feet in thickness. The rocks are chiefly gray sandstones and shales, with numerous beds of coal. Most of the coal of the region is believed to belong to the Laramie edge. The coals of the Raton, Dawson, Cerrillos, Carthage, and the Bear mountains are all regarded as Laramie coals.

EOCENE.

In northeastern New Mexico and in the Rio Grande Valley there are two large areas of gray shales and clays which reach a maximum thickness of over 800 feet. They have been referred to the early Tertiary and are called the Puerco series. A large vertebrate fauna has been obtained from them.

NEOCENE.

The later Tertiary beds are widely distributed. The Llano Estacado formation of eastern New Mexico, over 100 feet in thickness, appears to belong to this age. On Galisteo Creek south of Santa Fe certain sands are referred to the Neocene, as are the Santa Fe marls so extensively developed north of the city of Santa Fe. The marls extend down the valley of the Rio Grande at least as far as Socorro.

PLEISTOCENE.

To this age belong such formations as the Bolson gravels, the river gravels, alluvium, and many deposits of talus wash, besides some lake deposits.

LATE VOLCANICS.

Belonging to all ages from the Cretaceous to within probably the date of settlement of New Mexico are volcanic rocks of many descriptions. Some of them are lava flows, covering hundreds of square miles. Some are dikes traceable long distances. Many are probably of laccolitic character. Cinder cones are not uncommon.

Ash beds are abundant. Mount Capulin, in northeastern New Mexico, is a symmetrical cinder cone with a crater a mile across, a volcano as large, high, and majestic as the famous Mount Vesuvius, on the bay of Naples.

Table of geological formations in New Mexico.

Periods.	Series.	Thickness.	Terranes.	Rocks.
Cenozoic:				
Pleistocene		100		Bolson gravels, river gravels, talus wash.
Neocene	Santa Fe	200		Marls.
	Galisteo	250		Sandstones.
Eocene	Puerco	800		
Mesozoic:				
Cretaceous	Laramie	2,000		
	Montana	1,500		Shales.
	Colorado	800		Do.
	Dakota	300		Sandstones.
	Comanche	800	Washita	Do.
			Fredericksburg	Limestones.
			Trinity	Sandstones.
Jura-Trias	Cimarron	500		Red beds (part), clays, and sandstones.
Paleozoic:				
Carboniferous	Oklahoman	1,000	Bernalillo	Red and variegated shales and red beds in part.
	Rio Grande	500	Madera	Blue and gray limestone.
	Sandia	300	Manzano	Black carboniferous limestone.
	Mimbres	150	Placitos	Sandstone.
			Lake Valley	Limestones.
Devonian	Wanting?			
Silurian	Wanting?			
Ordovician	Wanting?			
Cambrian	Tonto			Sandstone.
Algonkian	Chuar	300		Shale and linestones.
	Grand Canyon	1,000		Sandstone with interbedded and cutting basic eruptives.
	Vishnu	500		Quartzite.
Azoic:				
Archæan		2,000		Granites, gneiss, schists (mica and H.).

THE MINERAL PRODUCTION OF NEW MEXICO.

By F. A. Jones.

The following is a report on the production of the precious metals of New Mexico, including also copper and lead, for the year 1902:

The aggregate production of gold, silver, copper, and lead was $1,489,016.

This result is rather disappointing in one sense, but when we come to consider the character of the improvements and the adaptability of the metallurgical processes for the treatment of the ores in the various camps it is quite gratifying to note the changes now going forward are a decided improvement over that of former years. As I stated in a similar report to you last year, New Mexico is now passing through a period of indigestion, as was the case with Colorado, Montana, and California, and erroneous ideas are fast being superseded by experimental facts and chemical analyses. The year 1902 was the year in which a strong undercurrent for the betterment of mining conditions throughout the Territory was noticeable in a marked degree, especially in some of the larger camps. It is believed that the mining operations conducted hereafter will be more on the conservative order, and the time has about passed for building mills that are wholly unadapted for the treatment of a particular class of ore. The metallurgical engineer is destined from now on to play an important part in the successful extraction of the metals of economic value from their common gangue.

The following table will show by counties the results of the mining in New Mexico for the year 1902, the data being gathered under the auspices of the United States Geological Survey.

DEEP MINES.

County.	Ore mined, 1902.	Ore sold or treated, 1902.	Stock of ore on hand—	
			Dec. 31, 1901.	Dec. 31, 1902.
	Short tons.	*Short tons.*	*Short tons.*	*Short tons.*
Bernalillo	9,194	8,399	7,288	8,083
Colfax	1,353	798	358	913
Doña Ana	415	90	2,415	2,740
Grant	55,110	40,804	106,447	120,753
Lincoln	23,500	6,400	6,000	23,100
Luna	1,955	1,851	5,610	5,714
Mora	250	.....	300	550
Otero	1,960	414	214	1,760
Rio Arriba	750	58	1,143	1,835
San Miguel	4,375	40	475	4,810
Santa Fe	2,960	467	5,101	7,594
Sierra	5,824	1,588	17,077	21,313
Socorro	23,734	16,264	11,007	18,477
Taos	1,968	.....	3,121	5,084
Valencia	10	.....	10	20
Total	133,353	77,173	166,566	222,746

County.	Gold.		Silver.		Copper.		Lead.		Total value.
	Crude ounces.	Value.	Crude ounces.	Value.	Pounds.	Value.	Pounds.	Value.	
Bernalillo	214,451	$44,182	35,427	$19,746	1,000	$110	.....	.....	$64,038
Colfax	17,200	3,552	73	38	.....	.....	.....	.....	3,590
Doña Ana	16,435	3,400	192	100	.....	.....	9,950	$400	3,900
Grant	380,789	78,710	48,513	25,125	7,251,757	793,028	464,840	18,162	915,025
Lincoln	244,828	50,607	11,520	6,009	.....	.....	.....	.....	56,616
Luna	.....	.....	10,382	5,416	.....	.....	711,825	28,275	33,691
Mora	.....	.....	.....	.....	.....	.....	.....	.....	.....
Otero	15,480	3,200	146	76	117,520	11,732	.....	.....	15,008
Rio Arriba	2,180	452	5,807	3,080	5,740	798	.....	.....	4,280
San Miguel	.....	.....	.....	.....	3,500	315	.....	.....	315
Santa Fe	30,674	6,341	1,808	945	3,250	390	32,331	1,294	8,970
Sierra	104,981	21,705	25,114	13,096	56,400	5,728	82,935	3,315	43,844
Socorro	202,947	42,056	146,503	75,078	540,000	48,636	1,189,004	43,489	209,259
Taos	.....	.....	.....	.....	.....	.....	.....	.....	.....
Valencia	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	1,229,965	254,205	285,485	148,659	7,979,167	860,737	2,490,885	94,935	1,358,536

PLACERS.

County.	Crude ounces.	Value.
Colfax	6,497.60	$117,680
Grant	192.35	3,665
Lincoln	28.52	550
Otero	14.40	275
Rio Arriba	6.40	115
Santa Fe	112.18	2,145
Sierra	309.58	5,960
Taos	5.14	100
Total	7,166.17	130,480

The above tables give the ounces in crude bullion. The number of ounces of fine gold valued at $20.6718 per ounce may be summed up in the following:

Source.	Fine ounces.	Value.
From lode	12,297.166	$254,205
From placer	6,311.970	130,205
Total	18,609.136	[a] 384,410

[a] The Director of the Mint gives the gold production of New Mexico for 1902 at $531,181.

A TYPICAL NEW MEXICO MINING TOWN—WHITE OAKS

THE NEW ERA MINE IN SIERRA COUNTY.

The ounces of fine silver valued at $0.5216 per ounce are:

Source.	Fine ounces.	Value.
From lode	285,006.000	[a] $148,689

It will be noticed that by comparing the production of 1901 with the above a heavy falling off in output of the precious metals occurs in Bernalillo, Santa Fe, and Socorro counties. The cause of this in Bernalillo County is due to the closing down of the Albemarle mine, in Santa Fe County to the suspension of work of the Santa Fe Gold and Copper Company, at San Pedro, and in Socorro County to the shutting down of the Rosedale mine.

The above properties when in operation produced about two-thirds of the gold of the Territory.

On the other hand, a decided increase is noticeable in Colfax, Doña Ana, Grant, Sierra, and Rio Arriba counties. The largest gain is in Colfax County, due to the big dredge of the Oro Dredging Company.

The property of the Oro Dredging Company produced 28.2 per cent of all the gold in New Mexico for 1902.

The large plant in course of erection on the Rio Grande near Rinconada, in Taos County, by the Glen-Woody Mining and Milling Company will no doubt revolutionize the treatment of low-grade gold ores. The Rio Grande will do all the mining and milling of the ore, the cost of which should not exceed 80 cents per ton.

The improvements now being made at the Cooney mine in the Mogollons are very commendable and show what the science of metallurgy is capable of doing. The Cooney mine will be one of the heaviest producers in New Mexico in 1903.

In almost every camp in the Territory similar improvements to those mentioned above are either completed or under way and verify what has been said in the outset, that the improvements now being made are substantial and are based on experimental facts in chemistry and metallurgy, and the elements of guesswork, ignorance, and chance are reduced to a minimum.

Under the new order of things mining in New Mexico has a very bright future.

While the mining of the precious metals, including copper, lead, etc., will always add materially to the prosperity of the Territory, the fact should not be overlooked that the real mineral wealth of New Mexico lies in her extensive deposits of coal and iron.

List of mining claims in New Mexico which have been officially surveyed, June 30, 1903.

[By Surveyor-General Morgan O. Llewellyn.]

Name of claimant.	Name of claim.	Mining district.	Area.
			Acres.
Santa Rita Mining Association	Santa Rita del Cobre	Santa Rita	31.213
San Agustin Mining Co	San Agustin	Organ Mountain	10.33
J. A. Hutchason et al	Montezuma	Spring Hill	20.66
Do	Pope mill site	Silver Flat	5
Wm. L. Rynerson	California mill site	do	3.3
David Abrahams	Peabody Lode	Chloride	6.88
G. A. Allen and A. A. Reviere	Twilight Ledge Star	Lone Mountain	6.89
S. S. Brannin	Satisfaction	Mimbres	20.66
D. C. Casey and A. McGregor	McGregor	do	10.35
J. R. McGruder	Chino	Santa Rita	20.66
Do	Yosemite	do	17.91
T. B. Catron	Hanover Copper	Hanover or Central	20.66
Do	Hanover mill site	do	5
H. M. Meredith	Naiad Queen	Mimbres	20.66
John R. Magruder	Uncle Samuel	do	20.66
I. N. Cohen and M. Lesinsky	Superior Copper	Virginia	20.66
Do	Artesian Well Placer	Santa Fe	159.37
J. Gwyn, jr., and E. Andrews	Baker Placer	do	159.83
Joseph Reynolds	Pacific	Pinos Altos	1.68
J. E. Greggs	South Extension Pacific	do	.14
N. Y. Ancheta	Ancheta mill site	do	4.91
Joseph Reynolds et al	Star of the West	Silver Flat	1.147
Martin W. Bremen	Seventy-Six	Chloride Flat	20.66
Do	Bremen	do	20.22
Thomas J. Bull	South Extension Pacific	Pinos Altos	5.86
Joseph Reynolds	Pacific	do	2.19
D. H. Moffat, jr	Santa Rita No. 20	Santa Rita	20.61
Do	Santa Rita No. 21	do	20.61
Do	Santa Rita No. 55	do	20.61

[a] The Director of the Mint gives the silver production of New Mexico for 1902 at $591,137.

List of mining claims in New Mexico which have been officially surveyed, etc.—Continued.

Name of claimant.	Name of claim.	Mining district.	Area.
			Acres.
Consolidated Bonanza Mining, Milling and Smelting Co.	Baca Bonanza	Cerrillos	10.33
Do	Marshall Bonanza	do	10.33
Do	Spiegelberg Bonanza	do	10.33
New York and New Mexico Mining and Smelting Co.	Rescue	Chloride Flat	4.28
Do	Hidden Treasury	do	5.77
Do	Emma	do	4.9
J. D. Adams et al	Memphis	Organ Mountain	20.66
Sierra Bella Mining Co	Little One	Lake Valley	.76
Do	Strieby	do	13.77
Do	Columbia	do	13.38
Do	Kohinoor	do	20.69
Do	Emporia	do	16.20
Sierra Grande Mining Co	Lincoln	do	19.78
Sierra Plata Mining Co	Stanton	do	17.79
Fletcher A. Blake	Vera Cruz	Nogal	20.6
The Mimbres Mining Co	Naiad Queen mill site	Mimbres	5
Do	Satisfaction Extension	do	20.66
Do	McNulty	do	20.66
Do	Lou	do	13.772
Homestake Gold Mining Co	Homestake	White Oaks	20.66
The Mimbres Mining Co	Lou mill site	Mimbres	5
Do	McNulty mill site	do	5
Do	Extension Satisfaction mill site.	do	5
Do	Uncle Samuel mill site	do	5
Paschal R. Smith, T	Parker	Burro Mountain	17.36
Do	Chief of the Burros	do	20.14
Leavenworth and White Oaks Gold and Silver Mining Co.	Badger Boy	White Oaks	18.395
Do	Gregory	do	12.96
Baxter Mountain Gold Mining Co	Henry Clay	do	20.63
John B. Reno	Mary Copper	Burro Mountain	16.75
C. Monjeau	Lottie Kirkham	White Oaks	20.66
Do	Star mill site	do	5
Paschal R. Smith	Marshall	Burro Mountain	20.66
Do	Signal Mountain	do	20.66
Abe Spiegelberg et al	Norma	Galisteo	20.66
Do	Bourbon	do	20.66
Paschal R. Smith	Emma	Burro Mountain	20.66
The Mimbres Mining Co	Uncle Samuel	Mimbres	19.76
Do	Hague	do	17.16
Thomas H. Kendrick, A	Lilly	Burro Mountain	20.27
W. T. Thornton et al	Graphic	Magdalena	20.66
Do	Review	do	20.66
Do	Waldo Lode	do	18.90
Do	Sampson	do	20.66
Josiah Arnold	Wellington	Pittsburg	20.66
Do	Stitsel	do	20.66
J. W. Knox	Buckhorn	Eureka	19.055
The Owl Mining Co	First Extension Hornet	do	20.56
Do	Bonanza	do	18.12
Do	Nabob	do	20.485
E. W. Eaton	Sophia	Magdalena	20.11
Do	Juanita Extension No. 1, south.	do	20.28
Vera Cruz Consolidated Gold Mining Co.	Bustamante	Nogal	20.61
Do	Washoe	do	12.86
John Paul et al	Woods	Apache	15.616
Do	Colossal	do	17.242
E. J. Fields et al	Wall Street No. 2	do	18.97
Red Cliff Silver Mining Co	Colonel Holliday	White Oaks	81.07
Ira D. Bronson et al	Buckhorn	do	19.73
W. W. Griffin	Jennie	New Placer	20.66
N. K. Fairbank	Carlisle	Steeple Rock	20.66
Do	Carlisle mill site	do	5
E. W. Eaton	Companion	Magdalena	19.80
Conquest Mining Co	Conquest	do	19.34
N. K. Fairbank	Homestead	Steeple Rock	17.91
Do	Columbia	do	19.46
The Magdalena Mining Co	Granger	Magdalena	20.20
B. E. Davies	Cove Springs mill site	Organ Mountain	8.57
Davies, Lesinsky & Co	Grand Daddy	do	17.87
Do	Alamo mill site	do	3.99
H. C. McComas et al	Innistoria	Stonewall	16.13
Do	Innistoria mill site	do	4.979
Paschal R. Smith	Oak Grove	Burro Mountain	20.66
Do	Oak Grove mill site	do	4.99
John E. Price et al	Little Maud	Pyramid	20.568
Silver Hill Mining Co	Silver Fountain	Cooney	14.70

List of mining claims in New Mexico which have been officially surveyed, etc.—Continued.

Name of claimant.	Name of claim.	Mining district.	Area.
			Acres.
Silver Hill Mining Co	Silver Bar	Cooney	19.23
Josiah Arnold	Keystone	Pittsburg	20.66
Do	Bonito	do	11.36
N. M. and I. Mining Co	Eureka	Señorita	17.30
Wm. A. Thompson et al	Eureka Central	Eureka	18.04
Do	Silver Crown	do	18.25
Newton Bradley	Hawley	Central City	20.615
H. M. Meredith	General Hancock	Tres Hermanas	16.54
Do	Toledo	do	16.55
J. M. Lacy and M. W. Neff	Black Eagle	Central City	16.522
Truman F. Chapman	Bullion	Black Range	18.41
Do	Last Chance	do	8.36
E. W. Eaton	Companion, north	Magdalena	18.35
Do	Spring	do	20.49
Joseph A. Moore	Little Jimma	Black Range	19.61
Peter Wagner	Atlantic No. 1	Pinos Altos	17.90
M. B. Tallant and C. Hauswald	Prussia	Silver Flat	16.22
Hugh J. Wilson	Blacky	Black Range	16.89
E. A. Walz	Corrington	White Mountain	9.920
The Solid Silver Mining Co	Black Hauck	Bullards Peak	9.67
Do	Black Hauck mill site	do	4.98
Do	Little Rhody	do	20.59
Do	Little Rhody mill site	do	4.97
Do	Silver Glance	do	20.085
Do	Silver Glance mill site	do	4.96
Do	Surprise	do	.83
Do	Surprise mill site	do	4.985
Richard M. White et al	Palomas Chief	Palomas	10.329
Chicago and New Mexico Mining Co.	Alaska No. 2	Black Range	11.73
James C. Logan	Polar Star	do	16.13
Superior Mining Co	Superior	do	20.01
John F. Jordan	Down East	Silver Flat	18.94
Alexander G. Lane	Omega	White Oaks	12.059
Do	Omega mill site	do	5
Superior Mining Co	August	Black Range	2.17
Gustav Billing	Aetna	Magdalena	20.66
Illinois Silver Mining and Milling Co.	Illinois	Black Range	15.76
Superior Mining Co	Relief	do	13.53
Do	Summer	do	.89
A. Staab et al	Great Western	Cerrillos	9.05
Lone Mountain Gold and Silver Mining Co.	Baby Mine	Bonito	15.956
John Doñahoo	Lady Franklin	Black Range	9.15
Bernard McDonald et al	Rose	Bullards Peak	14.10
John S. Hutchason	Agua Blanca	Magdalena	20.66
Superior Mining Co	Evening Star	Black Range	12.97
Do	Champion	do	1.57
Truman F. Chapman	Almira	do	18.73
Do	Almira mill site	do	4.98
Do	Subchief	do	17.12
Do	Subchief mill site	do	4.80
Do	Seaside	do	20.42
Do	Seaside mill site	do	4.96
Frank P. Boyd	Comstock	do	12.01
Do	Comstock mill site	do	4.99
William Light et al	Troy	Los Cerrillos	2.89
Samuel P. Foster	Equator	Iron Reef	20.66
Do	Equator mill site	do	5
Martin W. Bremen	Chloride	Chloride Flat	12.07
Do	Backbone	do	20.64
Gustav Billing	Vulcan Extension, north lode.	Magdalena	20.66
Do	Aetna Extension, south lode.	do	20.66
Thomas J. Peter	Sunset	Little Burro	17.21
Josiah Odell et al	Odell	Magdalena	20.66
Gustav Billing	Silent Friend	do	12.84
Vera Cruz Consolidated Gold and Silver Mining Co.	Golden Eagle mill site	Nogal	5
Herbert M. Carpenter	Good Hope	Bullards Peak	14.47
B. H. Dye	Large Hopes	White Oaks	9.32
Benson, Chandler, Thomas & Co	Alice Brinkman	do	19.68
Thomas J. Peter	Bill Findley	Little Burro	20.62
Aaron D. Dunbar et al	Silver Monument	Apache	16.89
James D. Reed et al	Ella	Iron Mountain	19.83
Do	Ella mill site	do	3.95
Henry Milney et al	Buckhorn	Red Cloud	16.99
Simon Leyser	El Dorado	Las Animas	19.95
Thomas J. Wright	Big Spring	Bromide	14.466
Silver Bar Mining and Smelting Co.	Blair	Cooney	1.64
Do	Blair mill site	do	4.36
Do	Northeast No. 2, Silver Bar	do	20.11

List of mining claims in New Mexico which have been officially surveyed, etc.—Continued.

Name of claimant.	Name of claim.	Mining district.	Area.
			Acres.
Silver Bar Mining and Smelting Co.	Silver Bar No. 2 mill site	Cooney	1.11
William S. Hathaway	Independent	San Andres	17.11
John H. Riley	Sulphur mill site	Organ	4.09
Samuel S. Jackson	Winona	Black Range	4.80
Do	Winona mill site	do	4.98
George Simmons	Two Best in Three	Burro Mountain	14.87
Do	Two Best in Three mill site	do	5
John W. Walton	Sulphur Bank	Jemes	20
Rolla Wells and W. Bonnell	Martin	White Oaks	20.65
Wm. Bonnell and W. F. Blanchard	Martin mill site	do	4.868
Rolla Wells et al	Emeline	do	20.66
William Bonnell	Nabours mill site	do	4.972
Gustav Billing	Vulcan	Magdalena	13.09
John E. Wilson	Miners Cabin	White Oaks	7.82
Do	Silver Cliff	do	7.70
Heman C. Collins	Louisville	Sierra	14.76
Sheridan Mining and Milling Co	Slayback	Cooney	17.32
Do	Slayback mill site	do	3.04
Do	Free Milling	do	19.46
Do	Free Milling mill site	do	4.41
C. A. Roeber and J. S. Daugherty	White Iron Alex	Nogal	16.476
Do	Tomahawk	do	20.66
Nathan Grayson et al	Union	Black Range	18.90
Norman C. Raff	Keystone	do	15.49
W. H. Patterson and S. Shreeves	Modock	Magdalena	20.66
D. J. M. A. Jewett et al	Diadem	Nogal	17.327
Nathaniel Moore et al	Diamond Crown	do	18.062
Alida McAlan et al	Franklin	Los Cerrillos	5.56
John Birdsall, T	Pinon	do	10.12
Rolla Wells	Homestake mill site	White Oakes	2.582
Nathaniel Moore	Texas Girl	Nogal	20.66
Do	Texas Girl mill site	do	5
George H. Utter et al	Standard	Gold Hill	20.31
Do	California	do	8.82
W. G. Robertson and E. S. Dolph	Copper claim and mill site	Nogal	14.858
Do	Correction	do	12.9325
Do	Correction, mill site	do	5
Rolla Wells	Pacific	do	14.005
Do	Pacific mill site	do	4.982
Do	Evalena	do	9.139
Do	Evalena mill site	do	5
Do	Helen Rae	do	2.686
Do	Helen Rae mill site	do	5
W. G. Robertson and E. S. Dolph	Tangle Lode and mill site	do	7.5153
John B. McGee	Afternoon	Magdalena	20.50
George Jones	Cassandra	Silver Flat	12.23
Rolla Wells	Smuggler	Nogal	16.533
W. G. Robertson and E. S. Dolph	Smuggler Lode and mill site	do	11.585
L. Bradford Prince	Open Sesame	Cerrillos	10.33
The Clipper Mining Co	Great Eastern	do	10.33
Wm. J. Quinlan, jr	Stanley	Apache	20.66
Do	Continental	do	20.40
Do	Western Belle	do	20.66
James E. Sligh et al	Solitaire	San Andres	20.48
Do	Solitaire mill site	do	5.00
James Hiatt	Hiatt	Blake Range	18.29
Southwestern Mining and Smelting Co.	James Fisk	Silver Hills	15.01
William Watson et al	Hannibal	White Oaks	10.3960
Do	Hannibal No. 2	do	7.05
Rolla Wells	Renowned O. K	Bonito	19.918
Emil L. Schoenberg et al	Contention	Black Range	10.93
R. C. Parsons	Hopeful	Bonito	12.318
Do	Hopeful mill site	do	4.97
Simon M. Blun	Great Republic	Cuchillo Negro	19.45
Do	Contention	do	15.69
Do	Champion	do	17.23
Walter C. Hadley	North Cardinal	Lake Valley	19.74
Do	Carolina	do	17.733
Do	South Carolina	do	19.99
Las Tusas Mining and Milling Co	D. G. Cambell	Headstone	10.21
Do	Cambell mill site	do	2.93
Gustav Billing	Iron King	Iron Mountain	20.66
Do	Midnight	do	20.66
Do	Magnet	do	20.66
John W. Harrison	Rita	White Oaks	9.6078
Organ Mountain Mining and Smelting Association (Limited).	Girard	Organ	20.639
Manuel G. Levy	Good Luck	Cuchillo Negro	20.25
Rolla Wells	Contention	Nogal	20
Do	Poor Man's Friend	do	5.68
Do	Wild Rover	do	20.02

List of mining claims in New Mexico which have been officially surveyed, etc.—Continued.

Name of claimant.	Name of claim.	Mining district.	Area.
			Acres.
Rolla Wells	Little Nell and Jicarilla	Nogal	29.84
Do	A. P. Livingstone Placer and Peggy Lode.	do	22.76
Do	Emma Placer and Bill Dad	do	34.04
Do	Michigan	do	19.90
The Eclipse Silver Mining Co	Eclipse	Black Range	18.61
W. G. Robertson and E. S. Dolph	Hancock	Nogal	6.75603
Rolla Wells	Nameless	do	2.808
Sara Jane Harsh	New England	Bear Mountain	20.659
Daniel Coomer	Iron Head	Hanover	20.66
Gustav Billing	El Paso Iron	do	19.57
Do	Kearney	do	18.53
Benjamin H. Dye	Lady Godiva	White Oaks	20.66
William Simpson et al	Thrifty mill site	Bonito	5
Duncan McKercher	Sucker Boy	Los Cerrillos	6.66
Iconoclast Mining and Manufacturing Co.	Iconoclast	Black Range	19.84
Rolla Wells	Neglect	Nogal	11.85
Timothy B. Sweet	Sugar Stake	do	20.66
Do	Copper Glance	do	20.66
Do	Copper Matte	do	20.66
Pecos River Mining Co	Victor Hugo	Cooper	17.32
Do	Daniel Deronda	do	14.49
Do	Maud Muller	do	18.37
W. Godfrey Hunter	Edith	Nogal	10.33
J. D. Powers and J. H. Hickman	Vanderbilt	do	8.626
Rolla Wells	John Brown	do	18.61
Do	Eighty-Seven	do	3.14
Do	Rochelle	do	19.23
W. G. Robertson and E. S. Dolph	Jennie Lind	do	15.3376
Rolla Wells	Helen Gardner	do	18.78
Sherman Mining and Milling Co	Sherman	Chloride	20.59
Rolla Wells	Big Spring	Nogal	13.90
W. G. Robertson and E. S. Dolph	Wide Awake	do	11.33689
Do	Wide Awake mill site	do	4.9992
Rolla Wells	Grover Cleveland	do	19.91
Amanda Haight	Greenville	Bonito	9.924
Do	Delphi	White Oaks	19.01
Allen Mining and Milling Co	Forest King	Black Range	19.50
Do	Forest Queen	do	19.29
Do	Ensign	do	3.19
Francis T. Underhill et al	Enterprise	do	11.63
Do	Silver King	do	12.40
Cornelius Bennet et al	Gulch Mine	Central City	18.09
Copper King Mining, Smelting and Refining Co.	Copper King	Las Animas	13.22
Do	Ventura	do	20.53
Do	Castle Hill	do	11.78
Do	Isabella	do	20.66
Do	Eighty-five	do	20.66
Do	Copperopolis	do	20.66
Max Shuts et al	Golden Giant	Pinos Altos	20.63
L. P. Browne et al	Scranton	White Oaks	19.076
James W. Turnpaw	Silver Bullion	Cow Spring	20.51
Do	Horn Silver	do	19.57
James A. Alcock	Water Cress	Nogal	9.49
James O. Nabours	Minnie Lea	White Mountain	17.158
Do	Copper Glance	Little Burro	19.03
William L. Davis et al	Charm	Black Range	18.3757
James A. Alcock	Homestake	Nogal	10.522
Chas. Berry et al	Treasury	Bonito	20.58
George E. Fitzgerald	American	Eureka	20.44
James C. Hart	Wisconsin	Las Animas	20.65
Do	"88"	do	20.42
Copper King Mining, Smelting and Refining Co. of New Mexico.	Soudan	do	20.59
Do	Republic	do	19.66
Bromide Mining Co	Bromide	Headstone	20.66
Bell and Stephens	Kept Woman	Pinos Altos	18.59
Do	Ohio	do	20.24
Mountain View Mining Co	Mountain View	do	9.26
William H. Berry et al	Dreadnaught	Apache	15.68
Do	Yankee Boy	Black Range	14.87
Do	Minnehaha	do	15.50
Wm. Frazer and J. R. Wheeler	Wigwam	Rio Hondo	20.10
Do	Mazzaroth	do	19.46
Do	Zone	do	18.85
Do	Silver King	do	19.76
Cooks Peak Mining Co	Rock Island	Cooks Peak	19.49
Do	Graphic	do	19.15
Michaelis Fischer	Carnero	Magdalena	20.68
Do	Pajaro	do	19.80

List of mining claims in New Mexico which have been officially surveyed, etc.—Continued.

Name of claimant.	Name of claim.	Mining district.	Area.
			Acres.
Michaelis Fischer	David	Magdalena	20.66
Pecos River Mining Co	Katydidnt	Cooper	18.32
The White Tower Mining and Milling Co.	Grand Tower	Gold Hill	18.72
Do	Monitor	do	18.72
Do	Stormer	do	20.66
Do	Grand Tower Placer	do	39.48
George H. Utter	Minneapolis	do	18.91
Do	Cleveland	Pinos Altos	20.64
John F. Coock	John Pelham	Red Hill	20.66
Virginian Mining Co	Virginian	Black Range	9.57
Josephus H. Fetter	Merrimack	Organ Mountain	16.32
Lydia J. Cadwell	Ricolite	Clarks Peak	12.005
Do	Jasper	do	12.69
Do	Green Onyx	do	15
Do	Chicago Girl	do	10.13
Do	Chicago Girl mill site	do	4.99
John H. Tracy	Lochiel Lode	Black Range	6.36
Do	Little Chief	do	14.02
Do	Susan Jane	do	20.12
Frank Vingo	Little Fannie	Cooney	20.66
F. X. Eberle	Clifton	do	19.27
Do	Eberle	do	18.89
Ernest L. Stephens	Anson 8	Hanover or Central	17.17
Dennis B. O'Brien	Good Hope	Lone Mountain	20.51
Do	New York	do	17.308
John H. Riley	Alamo Spring	Organ Mountain	20.66
J. B. Taylor	Copper Dick	Eureka	18.196
John Brockman	Cupola	Hanover or Central	20.56
L. Bradford Prince	Sunrise	Cerrillos	17.88
Do	Baltimore	do	10.18
The Midnight Mining Co	Tidal Wave	Apache	18.59
Geo. W. Toms et al	King	do	15.01
Ambrose R. Lee	Eighty-nine	Magdalena	20.66
Jonas Nelson	Fountain	do	20.66
Felix Leavick et al	South Alpine	Cooney	20.34
Do	South Alpine mill site	do	5
Do	Black Bird	do	18.34
Do	Black Bird mill site	do	4.96
James Cowell	Black Hawk	Magdalena	15.37
Southwestern Iron and Coal Co	Hanover Iron mine	Central City	10.28
Do	Iron Queen No. 1	do	18.97
Do	Iron Queen No. 2	do	20.28
Do	Iron Bottom	do	18.74
Felix Leavick et al	Red Bird	Cooney	6.58
Do	Blue Bird	do	14.94
Do	North Alpine	do	20.66
O. F. Perry et al	Iron King	Silver Buttes	8.52
Do	Iron Prince	do	9.49
Do	Iron Princess	do	9.19
Laidlaw and Sieverling	Prospector's Delight	Cuchillo Negro	19.36
The Cavern Mining Co	Cavern	Magdalena	19.98
Do	Grand Ledge	do	19.98
Do	Pearl	do	19.92
Jos. Seidenspinner et al	Pacific	Cooney	8.32
L. Bradford Prince	Nordhausen No. 1	Apache	20.54
Silver Mining Co	Bacon	Lake Valley	18.29
Do	Columbia	do	13.65
Do	Apache	do	20.07
Consolidated Kansas City Smelting and Refining Co., of El Paso, Tex.	South Extension of Republic.	Central City	20.566
The Ætna Mining Co	Cumberland	Black Range	19.395
Do	Katie	do	12.77
Michael Burk	Tip-Top	Victoria	10.42
Illinois Silver Mining and Milling Co.	Saratoga	Black Range	14.17
Lucien C. Warner et al	Alunogen Nos. 1 to 37, 43 to 64, 68, and 69.	Alumina	1,252.21
B. P. Waggener et al	Gladys	Cooks Peak	19.626
Rio Hondo Gold Placer Mining Co.	Squedunk, Carmencita, Hawkeye, Keystone, Amizette, Denver, and Humboldt.	Rio Hondo	621.497
Geo. W. Pritchard	Comstock	White Oaks	8.88
Do	Rip Van Winkle	do	3.53
Humboldt Mining Co	General Jerry Boyle	Virginia	20.318
John W. Brock	Union group (10 claims)	Hanover or Central	169.53
Do	Nonpareil	do	15.88
The Azure Mining Co	Arthur, Jewell, Santa Fe, Gem, Turquoise, Pearl, Henry Clay, Blue Bell, Ruby, Diadem, and Azure.	Burro Mountain	161.15

List of mining claims in New Mexico which have been officially surveyed, etc.—Continued.

Name of claimant.	Name of claim.	Mining district.	Area.
			Acres.
John E. Coffey	Top mill site	Cooney	5
John E. Coffey et al	Top Lode	do	13.973
Mineola Mining, Milling, and Melting Co., R. H. Hopper, agent.	Silver Wedge	Black Range	1.88
Thos. Luthian et al	Lone Star group (3 mines)	Cochiti	54.297
N. R. D'Arcy and J. Eagle	Iron King	do	12.75
Crown Point Mining Co	Crown Point	do	18.34
Cannon City Deep Down Mining and Milling Co.	Deep Down	Cooney	5.92
John W. Brooks	Chance group (4 mines)	Las Animas	53.19
John W. Brooks, trustee	Bully Boy, Snowflake, Snowflake No. 2.	Hanover or Central	48.19
Do	"86," Jim Fair No. 2, Jim Thayer, Givehart, Givehart No. 2, and Hugo.	do	95.13
Do	Pittsburg and Pittsburg No. 2.	do	38.13
Do	Continental and Continental No. 2.	do	29.61
Thomas Crowe	Gold Queen	Rio Hondo	20.321
F. J. Wissell	Chance	Central City	16.09
Minerva Gold Mining and Milling Co.	First Chance, Last Chance	Rio Hondo	40.348
Phoebe A. Hearst	Hearst mill site	Pinos Altos	4.660
T. Lowthian et al	Albemarle, Ontario, Huron, and Pamlico.	Cochiti	77.20
The Old Man Mining Co	Old Man No. 2	Bear Mountain	18.254
Samuel C. Wright et al	Divina Pastora	New Placers	20.66
The Argo Mining Co	Hazelton, Sunnyside, and Sunset.	do	34.31
Sarah E. Young	Last Chance	Red River	10.331
Henrietta Billing	Empire	Magdalena	6.776
Do	Carbonate	do	.38
Chas. B. Cole	Keepsake	Black Range	7.685
Do	Triangle	do	8.323
W. B. Childers et al	North Star	Cochiti	11.525
Michael Burk	Esperanza	Victoria	10.510
John S. Neeland et al	Mogul and Miners' Union	Cochiti	41.322
Steeple Rock Development Co	Alta, Surprise, Surprise Tunnel, Summit, Summit Tunnel, Apex, Irish Jew, Puzzle, Black Spar, and Jack Pot.	Steeple Rock	118.917
Do	Gold Pick, Gold Note, Sunset, Nugget, Great Eastern, McDonald, Davenport, and Gold Bug.	do	117.898
Do	Jim Crow, Imperial Consolidated Quartz M. G.	do	123.132
Do	New Year's Gift, Jumbo, Geronimo.	do	47.790
Neill B. Field	Abe Lincoln	New Placers	20.662
John T. Kelly, deceased	Dowling	do	20.662
Chas. H. Toll et al	No Name	Cochiti	20.662
Do	South Side	do	19.534
Do	Smuggler	do	20.662
Mariano S. Otero	Sulphur Bank No. 2, placer	Jemes	19.22
Argo Mining Co	Hazelton, Sunnyside, Sunset.	New Placers	34.29
Steeple Rock Development Co	Billali	Steeple Rock	11.597
Rockingham Gold Mining and Milling Co.	Mammoth	Rio Hondo	66.85
Peter Tolck	Lone Hill group	Coyote Springs	97.198
John W. Brooks et al	Smoky Jones	Las Animas	18.189
Charles F. Barclay et al	Anderson	do	16.457
Bayard Smelting and Mining Co	Texas	Central	20.17
Do	General Grant	do	14.79
Do	Phoenix	do	20.377
Do	Rio Grande	do	16.666
Do	Rio Grande No. 2	do	5.46
Do	Apollo	do	20.382
W. B. Childers et al	Sunny Side	Cochiti	15.092
Federico J. Otero et al	Washington	do	20.488
Bayard Smelting and Mining Co	Grand Central Silver	Central	17.95
Willard S. Strickler	Corona	Cochiti	10.18
Alexander G. Lane et al	Annie Cade	White Oaks	16.118
Ed Hatton	June Bug	Red River	10.33
T. S. Parker	Leap Year group (4 mines)	Burro Mountain	70.652
Do	Calaite group (4 mines)	do	57.208
Orrin D. Mallette	Willow Placer	Red River	96.587
H. B. Cartwright	Short Order group (3 mines)	Cochiti	7.39
George Gallup et al	Jaw Bone	Headstone	9.740

List of mining claims in New Mexico which have been officially surveyed, etc.—Continued.

Name of claimant.	Name of claim.	Mining district.	Area.
			Acres.
Helen Mining Co	Dutch Boy	Cooney	6.699
Jefferson Raynolds et al	Boomerang	Central	16.08
Owen Hughes et al	Hanover No. 2 group (4 mines.	Central	50.599
W. H. Earnest	Beauty Spot and mill site	Santa Rita	23.93
John W. Allen	Banner	White Signal	20.617
June Bug Mining and Milling Co	New Year	Red River	7.16
American Turquois Co	Castillian	Cerrillos	10.21
Do	Gem group (3 mines)	do	30.39
Francis X. Eberle	Braton	Cooney	17.329
Alabama Gold & Copper Mining Co.	Alabama group (6 mines)	Silver Hill	58.159
W. Hasselden and W. W. Strong	Empire	Cochiti	19.401
Thomas and John Scales	Iron Age No. 1	Limestone	14.91
Santa Rita Mining Co	Advance group (2 mines)	Central	41.218
W. S. Strickler et al	Monster	Cochiti	8.347
J. R. McKinney	Portland group (6 mines)	Central City	94.97
George Kingdon	Nora	do	4.008
C. E. and H. A. Kingsbury et al	Keystone group (2 mines)	Black Range	39.66
D. C. King	Santa Maria No. 1	Central City	16.516
C. E. and H. A. Kingsbury et al	U. S. Treasury group (2 mines).	Apache	37.70
Jones Taliaferro	Hoosier group (5 mines)	Red Cloud	98.2569
J. W. Oney	Little Jim	Santa Rita	17.523
Modoc Mining Co	Modoc group (3 mines)	Organ Mountain	46.32
H. H. Holchkiss et al	Hobo group (2 mines)	Hanover or Central	34.266
Julius Wild	Elberus	Apache No. 1	18.01
Santa Rita Mining Co	Eureka group (4 mines)	Central	76.72
Do	Booth group (12 mines)	do	190.249
Do	Clinton group (5 mines)	do	102.978
Julius Wellgehausen	Log Cabin	do	20.473
The Massachusetts and New Mexico Mining Co.	Legal Tender	Silver Flat	17.66
The Southern Pacific Mining and Mineral Land Co.	Yellow Jacket	Virginia	20.47
Do	Ophir	do	20.64
Do	Atwood	do	20.51
Do	Evening Star	do	13.90
Do	Henry Clay	do	20.59
The Plymouth Rock Mining Co	New Issue	Silver Flat	17.22
Charles B. Phillips	The Duryeer mill site	Cerrillos	5
John A. Miller	Northwest extension No. 1, Silver Bar mining claim.	Cooney	14.06
Martin W. Bremen	Baltic	Chloride Flat	20.66
William Owens	Chewawa	do	20.66
Do	Batopilas	do	20.74
Do	Santiago	do	20.66
Martin W. Bremen	Seneca	do	19.46
Williams Owens	San Vicente	do	20.86
William M. Pierson	R. E. Lee	Santa Rita	20.61
D. H. Moffat, jr	Santa Rita No. 1	do	20.61
Do	Santa Rita No. 2	do	20.61
Do	Santa Rita No. 3	do	20.61
Do	Santa Rita No. 4	do	20.61
Do	Santa Rita No. 5	do	20.61
Do	Santa Rita No. 6	do	20.61
Do	Santa Rita No. 7	do	20.61
Do	Santa Rita No. 8	do	20.61
Do	Santa Rita No. 9	do	20.61
Do	Santa Rita No. 10	do	20.61
Do	Santa Rita No. 61	do	20.61
Do	Santa Rita No. 11	do	20.61
Do	Santa Rita No. 12	do	20.61
Do	Santa Rita No. 47	do	20.61
Do	Santa Rita No. 58	do	20.61
Do	Santa Rita No. 59	do	20.61
Do	Santa Rita No. 60	do	20.61
Do	Santa Rita No. 24	do	20.61
Do	Santa Rita No. 48	do	20.61
Do	Santa Rita No. 49	do	20.61
Do	Santa Rita No. 50	do	20.61
Do	Santa Rita No. 18	do	20.61
Do	Santa Rita No. 25	do	20.61
Do	Santa Rita No. 26	do	20.61
Do	Santa Rita No. 30	do	20.61
Do	Santa Rita No. 27	do	20.61
Do	Santa Rita No. 28	do	20.61
Do	Santa Rita No. 29	do	20.61
Do	Santa Rita No. 31	do	20.51
Do	Santa Rita No. 33	do	20.61
Do	Santa Rita No. 57	do	20.61
Do	Santa Rita No. 14	do	20.61
Do	Santa Rita No. 15	do	20.61

List of mining claims in New Mexico which have been officially surveyed, etc.—Continued.

Name of claimant.	Name of claim.	Mining district.	Area.
			Acres.
D. H. Moffat, jr	Santa Rita No. 16	Santa Rita	20.61
Do	Santa Rita No. 17	do	20.61
Do	Santa Rita No. 34	do	20.61
Do	Santa Rita No. 13	do	20.61
Do	Santa Rita No. 22	do	20.61
Do	Santa Rita No. 23	do	20.61
Do	Santa Rita No. 53	do	20.61
Do	Santa Rita No. 54	do	20.61
Do	Santa Rita No. 19	do	20.61
A. M. Janes	Janes Placer	Whiteoaks	20
Robert Swan	Josephine	Silver Flat	17.32
Do	North extension Volcano	do	17.18
Do	do	do	17.18
Jno. D. Bail, U. C. Carrison, H. C. McComas, and T. M. Hall.	Contention	Tres Hermanas	10.95
A. M. Janes	Christopher	Whiteoaks	20.66
Fletcher A. Blake	Golden Eagle	Nogal	20.73
Whiteoaks Consolidated Mining Co.	Little Nell	Whiteoaks	20.65
Mimbres Mining and Reduction Works Co.	San Jose	Central City	20.66
John P. Risque	Ivanhoe	do	20.66
The Mimbres Mining Co	Glamorgan	The Mimbres	12.65
The Montezuma Silver Mining Co	Tip Top	Cooney	19.93
Do	Lucky Cuss	do	17
Do	Lone Star	do	20.32
The Ivanhoe Mining Co.	Ivanhoe	Blank Range	13.84
The Montezuma Silver Mining Co	Enterprise	Cooney	20.44
Do	Galveston Consolidated	do	18.33
Do	do	do	20.66
Do	Galveston Consolidated mill site.	do	3.03
The Silver Twig Consolidated Mining Co.	Silver Twig mill site	do	5
Do	Silver Twig	do	15.54
Do	Copper Queen	do	19.25
Do	Silver Twig No. 2	do	20
John A. Hug, Barney Tiernan, August Andreas, and John L. May.	Bismarck	do	20.19
John A. Hug	Montezuma	do	20.66
The Mimbres Mining Co	Lucas	Mimbres	10.27
Eli H. Chandler	Little Mac	Whiteoaks	18.87
The Leavenworth and Whiteoaks Gold and Silver Mining Co.	Senate	do	20.66
Paschal R. Smith	St. Louis Copper	Burro Mountain	20.66
Do	Milton Copper Mining	do	20.66
Do	Boston Copper Mining	do	20.66
Do	Colwell Copper Mining	do	20.66
Chicago and New Mexico Mining Co.	Alaska	Black Range	20.13
Do	Smuggler	do	3.36
Do	Montezuma	do	20.18
Do	Alaska mill site	do	4.877
Do	Rapidan	do	20.63
The Ivanhoe Mining Co.	Ivanhoe mill site	do	4.55
John Hewitt, and others	City	Whiteoaks	20.66
The Imperial Silver Mining Co.	Imperial	Iron Mountain	20.66
The Sterling Price Mining Co	Sterling Price	San Simon	18.308
Do	South Virginia	do	12.98
Do	Johnny Bull	do	18.75
The Monte Negro Mining Co.	Miantinoma	Apache	11.428
Do	Gray Eagle	do	8.015
The Sierra Negra Mining Co.	Eureka	do	13.04
The Teneriffe Mining Co	Walking John	do	18.375
The Tangier Mining Co	Washington	Black Range	20.38
The Schwazberg Mining Co	Chieftain	Apache	12.435
The West End Mining Co.	Miguel Otero	Whiteoaks	16.7
C. Monjeau	Yankee	do	19.6756
Do	Cambridge	do	18.678
J. S. Hutchason	Pueblo Spring	Magdalena	20.66
W. E. Pope, D. C. Roberts, Heber Smith, and John Boyle.	Miser's Chest	Virginia	20.64
P. Dorsey and Henry Henson	Kelly	Magdalena	20.66
Paschal R. Smith, trustee	Copper Mountain	Burro Mountain	20.5
The Owl Mining Co.	West King	Eureka	5.504
Thos. J. Lyman	Lyman	Whiteoaks	4.78
The Old Boss Mining and Milling Co.	Old Boss	Iron Mountain	20.66
The Mystic Lode Mining Co.	Mystic	Copper Mountain	20.66
Josiah Arnold	Marion	Pittsburg	20.66
Do	Pittsburg	do	20.66
Do	Ida	do	20.63
Do	Cora	do	20.66
W. T. Thornton, V. S. Shelby, and Wm. H. Manderfield.	Legal Tender	Magdalena	19.63

List of mining claims in New Mexico which have been officially surveyed, etc.—Continued.

Name of claimant.	Name of claim.	Mining district.	Area.
			Acres.
Geo. F. Wilson, jr., A. V. Comstock, S. M. Wyman, and A. P. Whittell.	Nuttshell	Fremont	13.016
W. T. Thornton, V. S. Shelby, and Wm. H. Manderfield.	Ouray	Magdalena	6.58
R. C. Davis and S. K. White	Emma	Iron Mountain	10.08
W. T. Thornton, V. S. Shelby, and Wm. H. Manderfield.	Cimarron	Magdalena	11.40
Do	Greyhound	do	20.66
A. D. Walker, J. F. Berry, W. W. Paddock, and J. W. Platt.	Old Boss, extension east	Iron Mountain	20.21
Josiah Arnold	Rebecca	Pittsburg	20.64
A. D. Walker and W. Walker	Hardscrabble	Magdalena	17.60
Henry Milne	Townsite	Whiteoaks	20.64
G. A. Mathews	Rubie	Lone Mountain	20.66
C. Monjeau	Uncle John	Whiteoaks	19.73
G. A. Mathews	Rubie mill site	Lone Mountain	4.73
John R. Magruder	Lordsburg	Virginia	20.66
Paschal R. Smith and Ozias Baily	Clara Clarita	Burro Mountain	16.85
Ethan W. Eaton	Juanita	Magdalena	19.83
Do	Juanita North	do	1.38
Do	Alhambra	do	19.99
Do	Grand Tower	do	11.72
Do	Sharon	do	20.18
Richard M. White et al	Embolite	Palomas	20.349
Do	Palomas Chief mill site	do	4.399
Do	Embolite mill site	do	4.64
W. A. Cade	Harry Allen	White Oaks	15.97
Samuel P. Foster	Albatross	Palomas	14.115
Do	Pelican	do	17.648
The Las Vegas and St. Louis Mining and Smelting Co.	Two Deuces	Magdalena	8.11
Do	Emerald	do	20.66
Do	Ace of Spades	do	20.66
Edward R. Bonnell	Nabours mill site	White Oaks	5
William D. Nourse et al	American Flag	Palomas	12.001
The Topeka Mining Association	Red Jim	Nogal	19.903
Do	Delaware	do	18.907
Do	Trust	do	18.016
Do	Cinnamon	do	15.399
Do	Union Jack	do	15.458
Do	Bornite	do	15.477
Do	Privateer	do	10.322
Patrick Dorsey et al	Tip Top	Magdalena	17
Iron King Mining Co	Iron King	Black Range	19.33
Do	Iron King mill site	do	4.91
John P. Eaker	Valley	White Oaks	20.01
E. A. Walz	Chester	Nogal	16.609
John W. Fleming et al	Old Man	Bear Mountain	18.18
Southwestern Mining Co	Buffom	Apache	15.078
Davies & Lesinsky	Hidden Treasure	Organ Mountain	14.01
Do	Garfield mill site	do	5
E. L. Martin et al	Tennessee	Silver Buttes	20.66
Do	Pine Tree	do	20.66
Robert Black	Belmont	Silver Flat	20.66
Do	Cambridge	do	19.99
Rio Bonito Silver Mining Co	Chinaman	Bonito	14.52
Josiah Arnold	Hillsborough	Pittsburg	20.66
F. E. Everett et al	Monaska	Bromide	15.492
Do	Traitor	do	16.2849
Do	7.20	do	18.854
Do	Contact	do	4.69275
Do	7.33	do	10.7886
Cedar Rapids Mining Co	James Morton	Silver Buttes	20.38
Do	Emerald	do	20.38
Chicago and New Mexico Mining Co.	John A. Logan	Apache	7.37
Do	Mountain Chief	do	12.21
Henry Fenton	Connecticut	Silver Flat	2.27
Gustav Billing	Silver Peg	Magdalena	19.86
Do	Extension No. 1, South Spring.	do	20.54
Do	Spanish Crown	do	4.98
Wm. J. Quinlan, jr	Copper Belle	Apache	20.66
Do	Livingston	do	20.66
The Rio Grande Copper Co	Rough and Ready	Mound Spring	20.66
The San Andreas Copper Mountain Mining Co.	Nonpareil	do	20.66
J. H. McLean et al	Bonnie Jean	Virginia	19.783
Leavenworth Gold and Silver Mining Co.	Burro	White Oaks	20.66
Reuben M. Sherman	Stone Cabin	Lake Valley	18.741
E. R. Bonnell et al	Red Dick	White Oaks	18.77
William Light et al	Cash Entry	Los Cerrillos	10.05

List of mining claims in New Mexico which have been officially surveyed, etc.—Continued.

Name of claimant.	Name of claim.	Mining district.	Area.
			Acres.
John Grass et al	Nuestra Senora de los Milagros.	Star	14.97
The Vera Cruz Consolidated Gold and Silver Mining Co.	Vera Cruz mill site	Nogal	5
Geo. L. Brooks et al	Golden Eagle	Iron Mountain	17.94
W. G. Hunter	American	Nogal	6.19
The Glorieta Mining Co	Darling Bell	Pinos Altos	7.19
Do	Pipestem	do	15.57
Do	Passaic	do	13.40
Do	Austin No. 2	Burro Mountain	14.48
George O. Smith et al	Scottish	Mimbres	20.49
Do	Commercial	do	12.846
Gustav Billing	Iron	Magdalena	2.35
The Old Man Mining Co	Old Man	Bear Mountain	18.29
Justus F. Seldomridge et al	Mangus	do	50
The Glorieta Mining Co	Tampico	Pinos Altos	15.43
Pecos River Mining Co	Evening Star	Cooper	12.99
Do	Evangeline	do	15.10
Do	Katy Did	do	12.68
E. A. Walz and T. F. Heacock	Chester mill site	Nogal	4.946
Geo. Turner and M. H. Chamberlin	Midnight	Apache	15.647
John S. Hutchanson et al	Ambrosia	Magdalena	20.05
Do	Middle Ambrosia	do	2.46
Do	Ambrosia Extension	do	20.65
George L. Brooks et al	Belcher	do	14.25
Willis A. Bostwick et al	Norman	Steeple Rock	16.29
William A. Cade	Forgotten	White Oaks	8.388
Francis J. Wilson	Chapeau	Black Range	16.64
John P. St. John et al	Anchor	Magdalena	17.70
Do	Bonanza	do	20.23
Do	Amasa	do	11.87
Do	None Such	do	20.43
Thomas J. Leeson et al	Saint Vicente	do	20.53
North Graphic Mining Co	Extension No. 1, North Graphic.	do	20.66
North Graphic Mining Co	North Graphic mill site	Magdalena	5
Silver Hill Mining Co	Old Strike	Cooney	17.63
John Y. Hewitt et al	Little Mack	White Oaks	18.24
Geo. T. Hope and Lord Sterling	Crœsus	Headstone	10.17
Do	Clara D	do	10
Do	Mary E. Steele	do	8.40
Do	Grand Mogul	do	8.6
Do	Little Casino	do	9.24
Francis J. Wilson	Hattie Bell	Iron Mountain	5.29
Sierra Grande Mining Co	Annie "P"	Lake Valley	19.67
Do	Sierra Grande mill site No. 2	do	4.9
J. L. Jenks et al	Nick of Time	Cerrillos	9.14
Jarilla Copper Co	Grizzly Bear	Jarilla	19.98
Do	Cinnamon Bear	do	18.49
Do	Brown Bear	do	20.66
The Organ Mountain Mining and Smelting Association, Limited.	Chippewa	Organ Mountain	20.66
Do	Short Cut	do	20.689
Do	Black Quartz	do	20.689
Mark Mitchell	Nona	Cow Springs	11.42
Malcom and Alexander McGregor	Grampian	Mimbres	19.62
H. H. C. Dunwoody	Captain Smith	Organ Mountain	20.66
Francis J. Wilson et al	Othello	Cooks Peak	15.51
Do	Desdemona	do	15.51
Stonewall Mining Co	Butternut	Bullard Peak	16.43
Do	Stonewall	do	13.99
Do	Pumpkin	do	20.39
John Bell and Mattie B. Mennett	Chloride	Pueblo	20.66
Southwestern Mining and Smelting Co.	Iron Duke	Silver Hills	19.05
Do	Providence	do	20.54
Do	Lone Star	do	16.37
Henry D. Bates	Colorado	Magdalena	20.66
Do	Ida L	do	20.24
Robert H. Hopper et al	Templar	Black Range	17.88
Charles Siedler	Smiling Jane	do	18.20
John S. Fraser et al	Lula	do	19.19
Lorenzo S. Lapham et al	Ironclad	do	20.3224
William Einstein et al	Ready Cash	do	8.1650
Lorenzo S. Lapham et al	Silver Wave	do	15.8308
Do	Crown Point	do	6.8888
Do	Little Lottie	do	14.0332
Jacob J. Mayer et al	Iron Queen	Silver Buttes	9.89
John W. Thomson and William J. Spence.	Summit	Red Cloud	20.275
Do	Summit mill site	do	4.89
Troullis Stephens	Potosi	Pinos Altos	17.788

List of mining claims in New Mexico which have been officially surveyed, etc.—Continued.

Name of claimant.	Name of claim.	Mining district.	Area.
			Acres.
Nathaniel Bell	Bell	Pinos Altos	12.17
Moses Thompson et al	Rattlesnake	Las Animas	16.2656
Do	New Years	do	19.87
Do	Compromise No. 1	do	20.6594
Karl A. Snyder	Folsom	Star	20.66
Alexander G. Lane et al	Homestake South	White Oaks	20.595
Benson, Chandler, Thomas & Co	Plata Verda	do	20.66
Do	Plata Verda mill site	do	4.37
Ladrone Gulch Mining Co	Independence	Black Range	17.93
Do	Little Stephen	do	12.67
Alexander Rogers et al	Black Colt	do	13.2849
John G. Baker et al	Henry Clay	White Oaks	20.64
The English and American Mining Co	"U. S."	Black Range	18.6976
James M. Sigafus	Homestake	White Oaks	9.52
William Whitacre et al	Emma	Hanson	20.66
Solitaire Mining and Milling Co	Solitaire	White Oaks	20.657
Benjamin H. Dye	do	do	7.256
Henry F. Dure	Little Homestake	do	18.164
Moses Thompson	Opportunity	Las Animas	19.781
Truman E. Chapman et al	Compromise No. 2	do	17.1856
Nicholas Galles et al	Compromise No. 3	do	20.1735
Delos R. Haynes et al	King No. 2	Apache	4.61
Benson, Chandler, Thomas & Co. et al	Iron Crown	White Oaks	18.3
Geo. L. Brooks and Donald McRae	Lawrence	Hanson	20.45
George L. Carroll	Pokohonta	Florida Mountain	13.367
Southern Pacific Co	Southern	Virginia	19.658
Emerson L. Smart	Bay City	Cat Mountain	20.66
Mrs. Anna J. Patten	Great Eastern	Magdalena	13.86
Do	Little Easy	Abbey	20.66
Theodore W. Heman	Rockford	Nogal	20.597
Do	Clipper	do	20.507
Do	Cashier	do	20.66
Rolla Wells and Erastus W. Parker	Maud	Bonito	20.63
Do	White Swan	do	20.549
George L. Carroll	Sunset	Florida Mountain	20.106
Do	Sunrise	do	19.916
Do	Silver Cave	do	13.471
Romulus N. Graham and William M. Tuttle.	Gutierez	Magdalena	20.66
Rolla Wells	Last Corner	Nogal	8.81
Do	Leona	do	19.29
Do	Little Minnie	do	19.87
J. H. Collard	Ironsides	Bonito	18.9568
William J. Littell	May	White Oaks	5.622
Do	May mill site	do	4.998
Rolla Wells	Schaenne	Nogal	19.04
The Aztec Mining Co	Aztec	Pinos Altos	20.307
Do	Asiatic	do	19.069
Do	Grey Eagle	do	12.43
Do	Golden Era	do	13.98
Do	Manhattan	do	11.52
Do	Montana	do	11.87
Do	Manhattan No. 2	do	14.59
Do	Valley Key	do	6.358
Hachita Mining Co	Copper King	Apache	19.10
Do	Mammoth	do	20.66
Do	Center	do	2.42
Silver Mining Co. of Lake Valley, N. Mex.	Plata	Lake Valley	20.42
Do	Silver Reef	do	17.94
Do	Arizona	do	18.71
Do	"Little Boy"	do	18.46
Do	Comstock	do	8.06
Do	Last Chance	do	20.14
Do	Strieby	do	12.93
Do	Emporia	do	17.04
George Schafer	Pinos Altos	Pinos Altos	13.777
Robert T. Howe	Emporia	Black Range	13.94
W. H. Lanning et al	Flagstaff	Palomas	18.83
Rolla Wells	Copper Stain	Nogal	18.53
George Schafer	Cornfield	Pinos Altos	12.99
Luther H. Halsted et al	Silver King	Bonito	16.91
Pelican Mining Company	Eagle	Palomas	12.98
Do	Vulture	do	20.31
The Organ Mountain Mining and Smelting Association, Limited.	McClellan	Organ	18.42
Do	Stephenson East	do	20.63
Do	Stephenson East mill site	do	2.75
William J. Littell	Empire	White Oaks	15.58
Do	He Horse	do	5.167
The Arizona Mining Co	Arizona	Pinos Altos	11.91
Do	Mogul	do	14.66

List of mining claims in New Mexico which have been officially surveyed, etc.—Continued.

Name of claimant.	Name of claim.	Mining district.	Area.
			Acres.
John Y. Hewitt et al	Robert E. Lee	White Oaks	20.106
Do	White Oaks	do	5.17
A. E. Head	Imperial No. 2	Santa Rita	5.317
Sarah Jane Harsh	Lead Hill	Pinos Altos	19.39
Do	Alice	Bear Mountain	20.66
Edmond J. Doran et al	Ocean Wave	Palomas	16.17
Sarah Jane Harsh	Denver	Bear Mountain	20.659
Do	Cora	do	19.60
Do	Sophie	do	19.16
Do	Paradise	do	19.16
The Templar Mining Co	Equator	Black Range	7.12
Samuel S. Jackson	Ranch	do	20.61
The Solid Silver Mining Co	Cornicopis	Bullards Peak	8.12
Do	Chicago	do	20.23
Do	Extension	do	13.71
J. B. Haggin	Virginia	Victorio	20.629
Do	Rover	do	19.07
Do	Chance	do	14.77
Do	Jackson	do	11.28
Do	Star	do	17.81
The Solid Silver Mining Co	Kent County	Bullards Peak	1.18
J. B. Haggin	Parole	Victorio	11.887
Benjamin E. Davies and Morris Lesinsky.	Home	Organ Mountain	7.08
W. C. Chandler	Moonlight	Black Range	17.22
Margaret C. Greaves	Cowboy	Hembrillo	13.55
Do	Cowboy mill site	do	4.80
George H. Utter et al	Little Charley	Gold Hill	15.97
Do	Golden Chief	do	20.64
Do	Noonday	do	20.10
Do	"87"	do	17.12
Frank C. Bell et al	Globe Democrat	Pinos Altos	4.24
Frank C. Bell	Good Enough	do	13.82
Gallinas Mining and Smelting Co	Red Cloud	Red Cloud	20.60
Do	Deadwood	do	20.583
Elbert T. Collier	Collier	White Oaks	6.494
Robert H. Hopper	Warm Spring	Black Range	20.61
Lucy Newcomb	Mayflower	Lone Mountain	16.26
Bell & Stephens	Bullion	Pinos Altos	11.017
Do	Mogul	do	12.44
Do	Mina Grande	do	16.57
Harry W. Elliott et al	Brush Heap	Black Range	19.4471
Do	Andy Johnson	do	19.8041
Do	Black Eyed Susan	do	17.8145
Peter Mungall and Julia Black	Thunderbolt	Hanover	20.04
John C. Root	Keystone	Oscura	19.914
Do	Keystone mill site	do	4.3949
San Pedro Placer Mining Co	San Pedro	New Placer	156.20
Chas. Gause et al	Silver Bell	Magdalena	18.11
The Magdalena Land and Cattle Co.	Lula C	Cat Mountain	20.66
Florence Silver Co	Belle	Magdalena	20.66
Grigg Titus et al	Time Lock	Palomas	19.98
Do	Key Hole	do	19.36
Jos. I. Eaton & Bro	Forrester	Magdalena	20.66
Do	Forrester Extension, north	do	6.33
Do	Birthday	do	20.66
Do	Helen Cross	do	10.96
Do	Silver Wave	do	16.44
Do	Grand Cross	do	20.66
Do	Lone Buck	do	20.24
Do	Oak Spring	do	20.66
Do	Lone Buck Extension, north	do	17
Do	Little Luella	do	19.81
Do	Hermosillo	do	20.59
Do	Two Duce No. 1 south	do	20.46
The St. Louis and Plata Rey Gold and Silver Mining Co.	Excess	Victorio	10.08
N. Y. Ancheta et al	Comanche	Carpenter	20.17
L. Rosenzweig et al	Bear	Magdalena	20.66
The Alhambra Mining Co	Alhambra	Bullards Peak	20.52
C. Clayton Cowles	Young America	Magdalena	20.66
Do	Young America mill site	do	5
Pio Papa et al	Perseverance	do	18.99
Felix Leavick et al	Confidence mill site	Cooney	5
Do	Confidence	do	12.07
A. B. Elliot et al	Antelope	Palomas	12.15
The Pinos Altos Mining Co	Georgia	Pinos Altos	16.729
J. L. Davis	Anirhold	Magdalena	20.62
Frank G. Bartlett	Candelaria	do	20.52
Wm. J. Quinlin, jr., et al	Iron Reef	Iron Reef	20.42

List of mining claims in New Mexico which have been officially surveyed, etc.—Continued.

Name of claimant.	Name of claim.	Mining district.	Area.
			Acres.
The Tuerto Mountain Copper and Gold Co.	Livingstone	New Placer	10.12
Do	Julia A	do	8.12
Chas. B. Cole	Julia	Black Range	13.27
Do	Great Republic	do	12.78
John P. St. John et al	Bonanza Extension	Magdalena	16.01
Do	Prince Albert	do	16.17
Wm. Watson et al	Placer No. 1	White Oaks	15.67
Ambrose B. Thomas, D. M. Lord, et al	Jumbo	Magdalena	19.40
S. E. Raunheim et al	J. I. C	New Placer	20.66
W. B. Childers et al	Imperial	Magdalena	18.14
A. F. Sortwell	Maud S. Silver Link and Wilson.	Cooney	39.04
F. X. Eberle	Clifton, Lexington, and Andrew Jackson.	do	60.56
E. J. Doran et al	"L"	Palomas	12.31
Arthur B. Keeler et al	Woodland group, No. 1; Woodland group, No. 2; Woodland group, No. 3; Woodland group, No. 4; Little Hazle, and Woodland group, No. 1, mill site.	Magdalena	90.57
Do	Iron Mask	do	16.93
Ellen Foley	Copper Cap	do	15.61
The American Silver and Lead Mining Co.	Surprise	Cooks Peak	16.09
The Consolidated Kansas City Smelting and Refining Co.	Monte Cristo	do	11.075
Bell & Stephens	Mackinaw	Pinos Altos	5.56
Do	Silver Rule	do	15.80
Do	Protection	do	9.25
George W. Norton	Walter N	do	19.14
Rio Bonito Silver Mining Co	Ottawa	Bonito	18.265
Leonard Lewisohn	Santa Fe Copper group, No. 1	New Placer	214.94
Do	Apex, Virginia, Copper Belle, Montezuma, Giblin, Frankfort, White, Puzzle, Richman, Bonanza, Magnolia, Ella, and Hoosier Girl.	do	220.50
Do	Mountain View, Colusa, and Greyhorse, and Greyhorse mill site.	do	63.62
The Old Abe Co	Owl	White Oaks	20.66
The Red River City Town and Mineral Co.	Gilt Edge	Red River	155.917
Asa B. Bement	Last Chance and Clara Sutton.	Pyramid	31.466
William H. W. James et al	James group	Central City	57.046
Thos. W. Cobb	Pinos Altos and Langston	Pinos Altos	3.644
Charles B. Eggleston and James P. Mallette.	Ross and Smuggler	Las Animas	22.62
J. N. Tholl et al	Cuchilla, Goldsmith, Bates, Baby Shoe, and Pallam.	New Placer	40.891
J. E. Wilson	Wilson	White Oaks	4.99
Frank E. Simpson	Cumberland, Congo, Sumter, Laura R., Copper Carbonate, Free Silver, Lime Mine, Copper Glance, Lexington, Superior, Little Key, Reservation Fraction.	Central City	173.734
T. B. Catron	Washington	New Placer	20.66
E. L. Ozanne and H. A. Ozanne	Dark Cloud	Jicarilla	20.19
A. W. Cleland, jr	Imperial	Magdalena	18.19
H. J. Abernathy and John H. Lakin	Mamie	do	19.76
James Deeney and Wm. B. Traylor	Last Attempt	Cooney	16.578
Lincoln, Lucky, and Lee Mining Co.	Amazon, Mystic Shriner, Virginia, Jessie B. Middleton, Lula S., A. J., Midnight, Denver Belle, Homestake No. 2.	New Placer	180.08
The Azure Mining Co	Cabinet	Burro Mountain	12.95
Do	Coeur de Lion	do	3.54
Do	Gyulo	do	.160
Do	Emerald and Malachite	do	36.656
James Caruthers	Beautiful Boy	New Placer	16.36
A. M. Hendry	The Ingersoll	do	20.56
Do	Anaconda	do	12.25
J. F. McLaughlin	C. & C	do	20.66
Dr. W. O. Owen	St. Joseph mill site	Central City	4.148

List of mining claims in New Mexico which have been officially surveyed, etc.—Continued.

Name of claimant.	Name of claim.	Mining district.	Area.
			Acres.
John Cullen, Will Dee Jones, H. K. Halloway, and E. T. Butler.	Jayhawk, Alpine, and National.	Red River	54.168
Last Chance Consolidated Mining Co.	Cross Lode and Boise City mill site.	Cooney	21.664
Do	Last Chance, Boise City, and Seattle.	do	35.291
Thomas J. Harlan and James G. Fitch	Czar and Czar mill site	do	21.250
Clinton H. Ball, Morgan H. Knowlton, and Alex. R. Knowlton.	Old Drop	Sandia	20.12
Joseph R. Burton	Lucky, Lucky No. 2, Nettie, and Lincoln.	Silver Hill	82.383
The Montezuma Gold Mining and Placer Co.	Billy B., Old Tom, and Hardscrabble.	Black Copper	51.384
J. B. Haggin	Victorio and Southern Pacific.	Victorio	40.386
		Pinos Altos	14.485
E. M. Young et al	Juniper		
Frank G. Bartlett and John M. Tyler.	Pearl	Magdalena	19.81
Do	Grand Ledge	do	20.40
Gold Mint Mining and Milling Co.	Gold Mint	Rio Hondo	15.665
Elizabeth P. Haynes	Good Will and Samoa	Black Range	19.3585
Saly Raunheim	Copper Queen group	New Placer	33.13
Do	"99"	do	19.78
Do	Columbus	do	20.28
Copper Hill Mining Co	Aztec group	Copper Mountain	123.30
The Graphic Mining Co	Keystone group	Cooks Peak	44.918
Do	Native Silver group	do	24.90
The Maggie G. Gold Mining and Milling Co., G. W. Fitzgerald, treasurer.	Maggie G. group	Black Mountain	38.152
Pablo Aranda, R. M. Carley, and Braulio Gallardo.	Gold Standard	New Placer	20.07
J. R. McKinnie	Hanover Annex L	Central	10.787
The Southwestern Coal and Iron Co.	Star group	do	75.464
The Hanover Improvement Co	Jersey group	do	36.335
William P. Sargeant	Duplex group	do	31.578
Do	Cinco Senoras	Central City	20.661
George Hofheins et al	Monte Cristo group	Cochiti	28.13
James V. Humphrey, trustee	Stonewall Jackson group	Black Mountain	36.598
Do	Dixie group	do	36.007
Do	Monometalist group	do	37.468
The Navaho Gold Mining Co	Denver girl group	Cochiti	34.78
Do	Uncle Joe No. 2	do	.58
Geo. Kingdon, assignee of Jane Hutchinson.	Emma	Central City	18.41
Ed. Hatton and Paul George	Banker	Red River	10.31
Jesse Wassermann	Laura Consolidated Quartz Mine group.	Steeple Rock	35.918
James B. Gilchrist	Copper Rose group	Mimbres	40.286
Nelbert O., Clinton A., and Clarence E. Dimmick.	Silver Cell group	Pinos Altos	80.201
James Shannon and John B. Wiley	Leap Year	Cooney	15.395
E. L. Medler, W. G. Hope, and G. M. Bower.	Ponto	Cochiti	6.44
J. M. Moad, L. E. Wade, P. B. Coffell, and C. L. Moad.	Esther	Red River	20.561
Jo. E. Sheridan and H. O. Bursum	Olympia group	Hanover or Central City.	24.189
George M. Bower and Calvin Whiting.	Avondale	Cochiti	17.2756
W. G. Hope et al	Rising Sun	do	14.82
The W. H. Martin Co	Great London Lode and mill site.	Rosedale	24.479
Do	Rothschild Lode and mill site.	do	24.552
Donaciana A. Bremen and Ida I. Bremen.	Baltic	Chloride Flat	20.027
The Torpedo Mining Co	Torpedo group	Organ Mountain	36.764
John St. Clair, G. B. Guthrie, and John Perry.	Clear Water	Central	16.16
The Taos Gold Mining and Milling Co.	Black Copper group	Black Copper	141.289
James S. Carter, trustee	Hondo	Hanover or Central	18.201
Frederick J. Sterner, Mrs. Mayme E. Marble, and Frank W. Graham.	Silent Friend	Black Range No. 2	20
G. Willett Van Nest and Christ Rugsegger.	Denver group	Cuchillo	34.82
John H. Leidigh	Mary Richmond group	Las Animas	34.527
Peter McRae	Detroit	Headstone	10.28
James McKenna	Stone Cabin	Lake Valley	19.656
The Mexican King Gold and Copper Mining Co.	War Eagle	Bromide	19.70

List of mining claims in New Mexico which have been officially surveyed, etc.—Continued.

Name of claimant.	Name of claim.	Mining district.	Area.
			Acres.
D. C. Beaman	Ninety-Nine	Central	12.683
Bessie Harper	Treasury Vault	Santa Rita	10.53
William O. Manson	American group	Eureka	162.66
H. E. Fox, A. B. McGaffey, and Thos. W. Briggs.	Monument	Cochiti	5.780
Prosper Gold Mining and Milling Co.	Prosper group	Las Animas	28.2256
M. K. Long	Edison	Keystone	10.289
Thomas B. Catron	Good Hope group	New Placers	71.262
The Keystone Copper Mining Co.	Pay Role	Bromide	20.58
Daisy B. Ashton	Oro Fino	do	20.335
Do	Little Eunice	do	14.52
The Allessandro Copper Mining Co.	Red Bird	White Signal	20.582
John Conley	Anaconda No. 3	Red River	10.328
Ramon C. Montoya	Golden Belt Lode and mill site.	Silver Mountain	25.2
Do	Buena Vista	do	20.66
Daisy B. Ashton	Copper Knob	Bromide	20.02
Do	Sumner	do	19.63
Do	Denver	do	20.365
Do	Ora	do	18.74
Willard P. Heath	Dorothy group	Central City	19.287
Lottie M. Ashton	Dora No. 1	Bromide	20.65
Do	Pigon	do	17.17
Daisy B. Ashton	Royal Purple group	Tres Piedras	123.966
J. G. Schumann	Corner	Cochiti	20.125
William S. Peters	Argonaut	Jicarilla	15.45
W. S. Peters and A. N. Price	Zulu	do	19.5112
R. L. Pooler and W. D. Kershner	Memphis	Keystone	20.36
Do	Cora Gibson	do	19.30
The Dixie Gold Mining and Reduction Co.	Homestake	Steeple Rock	15.12
John Conley	Anaconda group	Red River	50.8863
L. F. Hamblen	Guadalupe	do	142.70
Albert Guyer and Thomas Whalen	Whalen group	Cerrillos	30.147
Michigan New Mexico Copper Co.	Dacotah Pearl group	Virginia	40.032
Cashier Mining and Milling Co	Cashier group	Keystone	40.3367
Benj. F. Copp and Lucius P. Deming	Old Virginia	Burro Mountain	19.767
San Andreas Mining Co	Black Tail group	Dripping Spring	82.50
BelleRoyal Copper Mining and Milling Co.	Whale group	Bromide	39.395
Total acreage			23,800.97

RAILROADS IN NEW MEXICO.

Up to the date of writing this article activity in railroad building in New Mexico, which has been in progress the past few years, remained unabated, but at present there has come a temporary lull owing to the suspension for the time being on the New Mexico Eastern Railway from Rio Puerco to Llano, and on the Choctaw extension to Tucumcari. As a consequence the only railroad construction in progress at the present time is that of the New Mexico Southwestern Railway from Lumberton to Gallina, and of a branch line from Thoreau to the lumbering region of the Mitchell tract in Valencia County. However, work may be resumed at any moment on the New Mexico Eastern and on the Choctaw line, as well as on the Albuquerque Eastern, part of which is graded from Moriarty to Albuquerque.

The main event of the year in railroad matters has been the completion of the Santa Fe Central Railway, connecting the Chicago, Rock Island and Pacific system with the Denver and Rio Grande and the Atchison, Topeka and Santa Fe systems, the terminals of this new road being Santa Fe and Torrance. The Dawson Railroad from Tucumcari to Dawson was also completed. During the past fiscal year 257 miles were added to the railroad mileage of the Territory, increasing it from 2,263 miles to 2,520 miles. By January 1, 1905, New Mexico will have at least 3,000 miles of railroad.

The roads to be completed during the present fiscal year are: The New Mexico Eastern, from Belen to Willard, a distance of 55 miles, of which 10 miles are completed, from Rio Puerco to Belen, 12 miles, and from Willard to Llano, 14 miles; the New Mexico and Southwestern, 42 miles, of which 10 miles are completed; the Thoreau Lumber Branch of the Santa Fe and Pacific, 16 miles, of which 6 are completed; the Albuquerque Eastern, 42.8 miles; a Santa Fe Central extension, from Torrance to Roswell, 98 miles; the Choctaw connection at Tucumcari, 40 miles, or a total of

294 miles, so that the phenomenal pace set in railroad building by the past few years will be maintained. There are in addition quite a number of other railroad projects in contemplation, some of them having proceeded as far as organization and making temporary and permanent surveys, but certainty as to their immediate construction is still lacking. Of the 24 counties of the Territory all but San Juan have railroad mileage, and the latter, too, may be in the same category before another year has passed. Of the cities and towns there are two that have three railroad systems, viz, Santa Fe and Deming, while four have two railroad systems—Lordsburg, which has in addition a branch road of one of its systems; and Tucumcari, which has a third system, the Choctaw extending its line to it, and Torrance and French. There are quite a number of towns situated on the main and on a branch line of the same system, they being Albuquerque, Socorro, Rincon, Isleta, Nutt, Carizozo, Alamogordo, Whitewater, Waldo, Lamy, Dillon, Hebron, Hachita, and Carizalillo.

The principal railroad shops in the Territory are at Albuquerque, while smaller shops are maintained at Alamogordo, Las Vegas, Raton, San Marcial, Gallup, and Estancia.

THE ATCHISON, TOPEKA AND SANTA FE RAILWAY.

The Atchison, Topeka and Santa Fe Railway is the pioneer railway system of the Territory, and owns almost one-half of the railway mileage of this Commonwealth. Its main line and branches tap the most fertile and populous districts, and it has done much for the upbuilding of the future Sunshine State. The railway enters the Territory a short distance north of the station Lynn, in Colfax County, at an elevation of 7,557 feet, and passes southward through Colfax, Mora, San Miguel, Santa Fe, and Bernalillo counties, a rich stock, mining, and agricultural country, to Isleta, the junction point with the Santa Fe-Pacific, at an elevation of 4,877 feet. The important towns of Raton, Springer, Wagon Mound, Las Vegas, Cerrillos, and Albuquerque are on this division, besides a number of lesser settlements. The capital city of Santa Fe is connected with this line by an 18-mile branch line from Lamy. A short branch from Waldo taps the important Madrid coal fields, and a branch 12 miles long from Hebron Station, in Colfax County, taps the Willow Creek coal fields. From Dillon, in Colfax County, a branch 5 miles long enters the Blossburg and Gardner coal fields. From Las Vegas a branch a little over 6 miles long makes connection with Las Vegas Hot Springs and the famous Montezuma Hotel. The line has been leased and is now being operated as an electric railway. At Las Vegas and at Albuquerque the railroad company has built magnificent new depots and is building a new depot at the cost of $30,000 at Raton. At French, near Springer, this division is crossed by the Dawson Railway, and at Kennedy, a few miles south of Lamy, by the Santa Fe Central Railway. At Maxwell City the Taos, Cimarron and Taos Valley Railway, for which a company has been incorporated, and of which a survey has been completed, is to start, following the Cimarron River, thence the Moreno Creek to Elizabethtown, across the Taos divide to Taos and Embudo to a connection with the Denver and Rio Grande Railroad. It is not known when this line will be built, although it is to be in the near future.

From Isleta south the Santa Fe Railway winds through the fertile Rio Grande Valley, an almost continuous garden, passing the important towns of Los Lunas, Belen, Socorro, San Antonio, San Marcial, Rincon, and Las Cruces, entering Texas at the station of La Tuna, at an elevation of 3,770 feet. The distance from Lynn to La Tuna is 485 miles. The first branch line south of Isleta connects Socorro with the mining town of Magdalena, a distance of 27 miles. A company has been incorporated to build the Black Range Railway from Magdalena into Sierra County, and the survey has been made, but construction work has not yet been commenced.

From Rincon a branch line touches the railroad center of Deming, where connection is made with the Southern Pacific and the El Paso and Southwestern Railway. The terminus of this branch is at Silver City, the prosperous county seat of Grant County. The length of this branch line is 101 miles. From the Rincon branch at Nutt a spur has been built to the mining camp of Lake Valley, 13 miles. From Whitewater station a spur has been built to the mining camp of Santa Rita, in Grant County, a distance of 18 miles, while from Hanover Junction, on this branch, there is a spur to Fierro, a distance of 6½ miles. This part of the system from Isleta to El Paso, with its branches, enters the counties of Bernalillo, Valencia, Socorro, Doña Ana, Luna, Grant, and Sierra.

From Isleta the Santa Fe-Pacific Railroad strikes across the Continental Divide into Arizona, having its termini at San Diego, Los Angeles, and San Francisco, Cal. Gallup, a coal-mining town, is the principal city on this road in New Mexico. This line leaves the Territory near the station of Manuelito. The distance from Isleta to the Territorial boundary is 162 miles. A branch line from Thoreau to Farmington

and Durango has been discussed, but no definite steps have been taken to build it. A branch line is under construction from Thoreau southward into the timber belt of McKinley and Valencia counties, a distance of 16 miles. The large railway shops of the Santa Fe-Pacific are located at Albuquerque, and shops and offices are maintained at Raton, Las Vegas, and San Marcial for the Santa Fe Railway.

The Santa Fe Railway Company some years ago acquired the Pecos Valley and Northeastern Railway, which traverses the counties of Eddy, Chaves, and Roosevelt, entering the Territory from the south on the Texas line, from there following the Pecos River to near Roswell, and from thence running northeast to Roosevelt County out of the Territory into Texas again, in which State a junction is formed with the Colorado and Southern Railway, as well as with the Southern Kansas and Panhandle division of the Atchison, Topeka and Santa Fe Railway at Amarilla. The Pecos Valley and Northeastern Railway commands an immense stock business and in New Mexico passes through a rich stock as well as agricultural region. The beautiful and prosperous towns of Carlsbad, Hagerman, Roswell, and Portales are on this line, which is 192 miles long in the Territory. In connection with the Pecos Valley and Northeastern Railway, the Santa Fe Railway system has decided upon an important railway project which will give it the shortest line of any transcontinental road to the Pacific coast from Chicago and Kansas City. This is the building of 250 miles of standard-gauge railroad from Texico, Roosevelt County, to Belen, on the Rio Grande, there to cross the river, and a few miles farther on to connect with the Santa Fe-Pacific at or near Rio Puerco, in Valencia County. This line will connect with the New Mexico Eastern near Willard. The New Mexico Eastern is a subsidiary line of the Atchison, Topeka and Santa Fe. When operations were temporarily suspended on the construction of this line a few weeks ago, 65 per cent of the grade between Belen and Willard, 55 miles, had been completed; 12 miles of track had been laid, and part of the bridges had been constructed. The following are to be stations on this new line:

Name of station.	Distance.	Elevation (sea level).	Name of station.	Distance.	Elevation (sea level).
	Miles.	*Feet.*		*Miles.*	*Feet.*
Belen	.....	4,787.72	Abo Summit	7.1	6,470
Jarales	4.7	4,844	Eagle	5.9	6,259
Colorado	5.9	5,022	Willard	7.5	6,083
Becker	8.5	5,152	Santa Fe Central Railway	.4	6,078
Sais	6	5,422			
Scholle	6.6	5,803	Total	55	.....
Torneado	6.4	6,127			

The following are the most important steel bridges on the line:

Rio Grande, near Belen, seven 100-foot girders.
Twelve crossings over the Abo River (between Sais and Scholle).
Crossing No. 1, five 100-foot girders.
Crossing No. 2, four 100-foot girders.
Crossing No. 3, four 90-foot girders.
Crossing No. 4, four 90-foot girders.
Crossing No. 5, three 80-foot girders.
Crossing No. 6, four 80-foot girders.
Crossing No. 7, four 54-foot girders.
Between Scholle and Torneado—
One 70-foot girder.
One 90-foot girder.
One 80-foot girder.
Between Abo Summit and Eagle—
One 40-foot girder.
One 48-foot girder.

A line from Roswell to El Paso is spoken of, but the project has not yet taken tangible shape.

The New Mexico and Eastern, with its completed extensions, will add 265 miles to New Mexico railway mileage.

Passing or tapping as it does seventeen out of the twenty-four counties of the Territory, the Atchison, Topeka and Santa Fe Railway enjoys a commanding position in the railroad situation of the Territory, from which it draws a gratifying amount of passenger and freight traffic. The railway company in turn is fostering industries and encouraging immigration along its lines. The coal fields, mining districts, agricultural sections, stock ranges, scenic beauties, historic and prehistoric attractions reached via this line in New Mexico mean an ever-increasing traffic and revenue to the system which has done so much for the great "Sunshine" Territory.

THE DENVER AND RIO GRANDE RAILROAD.

Almost simultaneously with the Santa Fe system the Denver and Rio Grande Railroad entered the Territory from the north, but, unlike the Santa Fe, it has added but little to its mileage since its advent into New Mexico. The road enters the Territory 5 miles south of Antonito, Colo., traversing Taos and Rio Arriba counties, and near Embudo enters the fertile Rio Grande Valley, leaving it again south of San Ildefonso and making its terminus at Santa Fe. The distance is 120 miles. The line is narrow gauge, but definite assurance has been given that it will be made standard gauge within a year or two. Santa Fe and Espanola are the most important towns on this line, although it also carries the freight and passenger traffic for the town of Taos, which is reached by stage, and other settlements in Taos and Rio Arriba counties. The scenery along part of the line is magnificent in its grandeur, and it passes through the fertile and beautiful Espanola Valley. The main line of the Denver and Rio Grande Railroad, from Antonito to Durango, also narrow gauge, goes for 69 miles through Rio Arriba County, the principal towns on this line being the coal camps of Monero and the railroad town of Chama. The scenery along this line in New Mexico, especially in the Cumbres Range, is among the most magnificent in New Mexico. Near Chama a branch 17 miles long traverses the timber lands on the Tierra Amarilla grant. From this line a branch is being built from Lumberton to Gallina, in Rio Arriba County, 42 miles long, of which 10 miles are completed and 15 miles graded. The line is being built primarily to open a rich timber region. The entire mileage of the Denver and Rio Grande Railroad in New Mexico is 225¼ miles, and it traverses the counties of Taos, Rio Arriba, and Santa Fe, which are capable of immense development and even at present furnish a large tonnage to the road. A subsidiary company of the Denver and Rio Grande Railroad has been incorporated to build a branch line into the fertile San Juan and Las Animas valleys, but no permanent survey has yet been made.

THE SOUTHERN PACIFIC.

The Southern Pacific Railroad traverses 167½ miles in southern New Mexico, entering the Territory 3 miles west of El Paso, Tex., and running through Doña Ana, Luna, and Grant counties, crossing the Arizona boundary near Steins Pass, at an elevation of 4,097 feet. The elevation at the Texas boundary is 3,740 feet. Deming, where connection is made with the Santa Fe and the El Paso and Southwestern, and Lordsburg, where connection is made with the Lordsburg and Hachita and the Arizona-New Mexico railroads, are the principal towns on this road in New Mexico. The road passes through an extensive stock country and touches several important mining districts. The line between Strauss and the Rio Grande River was rebuilt this fiscal year in order to obtain a better grade. The distance is about 11 miles, and the reconstruction, including a new bridge over the Rio Grande, will cost $1,500,000.

THE COLORADO AND SOUTHERN RAILROAD.

The Colorado and Southern Railroad, which connects Denver, Colo., with Fort Worth, Tex., crosses the northeastern corner of New Mexico, its mileage being entirely in Union County. The line enters the Territory near Emery Gap at an elevation of 6,462 feet and leaves the Territory, after traversing it for 83 miles, at Texline, Tex., at an elevation of 4,694 feet. The principal towns in New Mexico on the Colorado and Southern are Clayton, the county seat of Union County, and Folsom. The section traversed is mainly a stock country.

THE CHICAGO, ROCK ISLAND AND PACIFIC SYSTEM.

Next to the Santa Fe system, the Chicago, Rock Island and Pacific Railway, with its allied railroads, has the greatest amount of mileage in the Territory. This is of recent construction, the El Paso and Northeastern Railway having been built about five years ago and the other parts of the system within the past two years, while the Dawson branch was completed last year. The coming of this system is doing great work for the development of the hitherto somewhat neglected eastern and east-central portions. New towns have sprung up along the line, and population in the sections traversed has been doubled in two years.

The line from the Texas-New Mexico boundary is known as the Rock Island and El Paso Railway, while the line from Santa Rosa to Carizozo is the El Paso and Rock Island Railway, and the line from Carizozo to El Paso is the El Paso and Northeastern Railway, the latter two, as well as the Dawson line, being operated by the El Paso and Northeastern Railway Company, an independent organization. The

mileage of these three railways is 384 miles, and of their branch lines as far as constructed 130 miles. These lines cross or enter Union, Quay, Leonard Wood, Valencia, Lincoln, Socorro, Otero, San Miguel, Mora, and Colfax counties, passing in a greater part through a wealthy stock country, but also tapping the Dawson and Capitan coal fields, rich mining districts and fertile agricultural sections. After entering New Mexico from Texas the first town of importance on the Rock Island and El Paso Railway is Tucumcari in Quay County, near the Union County line. Here the Dawson Railway starts, crossing the Santa Fe Railway at French, in Colfax County. The line from French to Dawson is 19 miles long, while the line from French to Tucumcari is 111 miles. After Tucumcari the only other important town on the Chicago, Rock Island and El Paso Railway is its terminus, Santa Rosa, where a high bridge crosses the Pecos River. At Llano station the New Mexico Eastern will cross the Rock Island and El Paso. At Santa Rosa connection is made with the El Paso and Rock Island Railway, which terminates at Carizozo, in Lincoln County, where connection is made with the El Paso and Northeastern Railway for El Paso. The length of the El Paso and Rock Island Railway is 128 miles. It passes through a stock and mining region. At the town of Torrance connection is made with the Santa Fe Central Railway. From Carizozo the Capitan branch of the El Paso and Northeastern runs to Capitan, a distance of 21 miles. This line taps the Capitan coal fields and the Nogal, Whiteoaks, and other gold-mining districts. A short spur has been built to Nogal from Nogal Springs on the Capitan branch. From Carizozo the El Paso and Northeastern runs to El Paso, crossing the New Mexico-Texas line south of Hereford. The mileage of this road in New Mexico is 126 miles. The principal town on this line is the prosperous and progressive city of Alamogordo, founded only four years ago. At this point the wonderful Alamogordo and Sacramento Mountain Railroad, which is an engineering marvel, starts, touching the settlement of La Luz, the summer resort of Cloudcroft, at an elevation of 8,650 feet, and having its present terminus at Cox Canyon. This road was built to haul the timber from the Sacramento Mountains to the large sawmills at Alamogordo. In its course of 28 miles it climbs from an elevation of 4,320 feet to an elevation of 8,800 feet.

At Jarilla Junction a 3-mile spur taps the Jarilla mining camp.

The Rock Island and El Paso, the El Paso and Rock Island, and the El Paso and Northeastern railways, give the Chicago, Rock Island and Pacific system the shortest line from Chicago and Kansas City to El Paso and Mexico, and by way of the Southern Pacific to Los Angeles.

THE EL PASO AND SOUTHWESTERN AND ALLIED RAILWAYS.

The El Paso and Southwestern Railway is another new railroad in New Mexico, having been completed only this year. Its western terminus is Douglas, Ariz., where connections are made with lines of the same system for Bisbee and Nacosari, the former in Arizona and the latter in Mexico.

The length of the El Paso and Southwestern line is 250½ miles in New Mexico. The road is finely constructed, having all the appliances of modern railroads, and nowhere has the work or material been skimped or slighted. The steel weighs 80 pounds to the yard. The motive power and equipment is first-class in every respect. The 20 miles from El Paso west has been the hardest and most expensive to construct, as it involved a grade crossing with the Southern Pacific, the building of an expensive bridge across the Rio Grande, and the overcoming of a heavy grade. The engineering of this portion of the road has been so skillfully done, and the grades and curves so distributed, that an engine can take an ordinarily loaded train over this line without the aid of a helper.

This magnificent piece of railroad building has been done by the firm of Phelps, Dodge & Co., in order to put its copper mines at Bisbee, Ariz., and Nacosari, Mexico, in connection with competing railroad lines at El Paso, Tex. The same company has also built a railroad from Douglas, which is in Arizona, near the Arizona-New Mexico line, south to Nacosari.

The Lordsburg and Hachita road, 38½ miles long, runs from Lordsburg to Hachita, entirely in Grant County. It is a standard-gauge road, laid with 80-pound steel. This road was built by the Arizona Copper Company, of Clifton, Ariz., as a continuation of its road from Clifton to Lordsburg, to connect with the El Paso and Southwestern, which it does at Hachita. This gives the Arizona Copper Company a competing freight outlet.

Phelps, Dodge & Co. are the stockholders of the Detroit Copper Company at Morenci, Ariz., some 7 miles from Clifton, and the freight of this company has always been handled by the Arizona and New Mexico road, so there is a "community of interest" between Phelps, Dodge & Co., the owners of the El Paso and Southwestern,

and the Arizona Copper Company, the owners of the Arizona and New Mexico and the Lordsburg and Hachita roads. While the copper mines that demanded the building of these roads are in Arizona and Mexico, the greater part of the roads themselves are in New Mexico. These lines always command large stock shipments and a heavy tonnage in addition to ore and fuel. At Deming the El Paso and Southwestern connects with the Santa Fe and the Southern Pacific lines, and at Lordsburg the Lordsburg and Hachita line connects with the Southern Pacific and the Arizona and New Mexico railways.

The Arizona and New Mexico Railway from Lordsburg to Clifton, Ariz., is part of the El Paso and Southwestern System and has 30 miles of railroad in New Mexico. This line was within the past two years changed from a narrow to a standard gauge.

A branch line of the El Paso and Southwestern is to be built from Deming to the mining camps of Santa Rita and Hanover.

THE SANTA FE CENTRAL RAILWAY.

One of the most important railway projects for New Mexico in recent years is that of the Santa Fe Central Railway Company, which connects the Denver and Rio Grande and the Santa Fe systems with the Rock Island system. The last spike on the main line was driven at Kennedy on August 13, 1903, and the road is now in operation between Santa Fe and Torrance. Its junction point with the Rock Island is at the town of Torrance, in Lincoln County, and its terminus is Santa Fe. At Kennedy the Atchison, Topeka and Santa Fe Railway is crossed. The Santa Fe Central main line is 116 miles long, running on easy grades, varying in elevation from 6,050 to 7,000 feet. It is developing one of the richest sections in New Mexico. New towns are being laid out, the principal being Moriarty, Estancia, and Willard. A branch line, to be known as the Albuquerque Eastern Railroad, will leave Moriarty station, in Santa Fe County, and through Tijeras Pass will enter the city of Albuquerque. This branch line will be 42 miles long, and is to be completed some time next year. Sixteen miles of its grade is completed.

A line 98 miles long, to be known as the Roswell, Santa Fe and Northeastern Railway, has been surveyed by the Santa Fe Central to connect Torrance with Roswell, at which latter point connection will be made with the Pecos Valley and Northeastern Railway of the Santa Fe System, and from which point it will be extended to Bigspring, Tex., there to connect with the Texas Pacific. The New Mexico Eastern will cross the Santa Fe Central main line at Willard, 82 miles south of Santa Fe. A branch line of the Santa Fe Central has been surveyed from Estancia to the wonderful salt lake on the Estancia plains, while another branch has been surveyed from Albuquerque and San Felipe to Durango, Colo. The country opened by the Santa Fe Central Railway is being settled up rapidly. The main line passes through the counties of Santa Fe, Sandoval, Valencia, Lincoln, and Torrance, the last named to be established on January 1, 1905. The proposed branch lines will in addition tap Bernalillo, Rio Arriba, and San Juan counties. The following are the stations on the main line of the Santa Fe Central:

No.	Stations.	Miles.	Elevation.
			Feet.
1	Santa Fe	0	7,000
2	Donaciana	7	6,650
3	Vega Blanca	17	6,400
4	Kennedy	23	6,050
5	Clark	29	6,125
6	Stanley	41	6,370
7	Moriarty	53	6,250
8	McIntosh	62	6,175
9	Estancia	69	6,140
10	Willard	82	6,125
11	Progreso	93	6,210
12	Bianca	100	6,285
13	Camaleon	110	6,425
14	Torrance	116	6,475

ALBUQUERQUE EASTERN RAILWAY.

1	Moriarty	0	6,250
2	Frost	16	6,300
3	Tijeras	26.5	6,280
4	Albuquerque	42.8	4,950

NEW LINES PLANNED.

The so-called Choctaw Railroad, recently acquired by the Rock Island System, is building an extension from Weatherford, Okla., via Amarilla to Tucumcari, there to connect with the main line of the Rock Island, as well as with the Dawson line. The greater part of this line had been graded when work was temporarily suspended a month ago, but is to be resumed in the near future.

The Colorado and Gulf line has been surveyed from Durango, Colo., to Clifton, Ariz., passing through the counties of San Juan, McKinley, Valencia, Socorro, and Grant. The project is feasible, as the western part of New Mexico is still without a north and south line, and the territory traversed by the survey would yield a heavy tonnage in coal as well as in minerals, stock, wool, hides, and farm and garden products.

A Denver and Rio Grande line from Fort Garland, Colo., to Embudo, Taos County, to traverse Taos County, is projected, but the matter has not yet assumed definite shape.

It is understood that the Santa Fe contemplates sooner or later building a branch line from Engle to Fairview, Chloride, and other points in the Black Range, in Sierra County, to connect with the proposed Black Range Railway from Magdalena to Chloride.

Among other railroad projects is the Las Vegas, Mora, and Taos Valley line, which is in part surveyed, but for the building of which no definite arrangements have yet been made.

A permanent survey has been made of the California Short Line from Alamogordo to Deming, passing near Las Cruces.

The railway milage actually constructed in New Mexico is as follows:

	Miles.
Atchison, Topeka and Santa Fe system	1,066
Chicago, Rock Island and Pacific and allied railways	542
El Paso and Southwestern and allied railways	319
Denver and Rio Grande system	226
Southern Pacific	168
Colorado and Southern	83
Santa Fe Central	116
Total	2,520

The mileage under construction is:

New Mexico and Southwestern	32
Thoreau branch	10
New Mexico Eastern	71
Choctaw	40
Total	153

The additional mileage planned for early construction:

Santa Fe Central branches and extensions	168
El Paso and Southwestern branches	42
Total	210

Early in the spring of 1879 it was the fortune of the writer to pass through the Territorial empire of New Mexico from Trinidad, Colo., to Las Cruces and Silver City, in the extreme southern part of the Territory, tediously traveling the entire distance of upward of 700 miles in old-fashioned stagecoaches at the rate of about 5 miles an hour. Less than two years later he passed over part of the same route, but the slow going and toiling stagecoach had disappeared, and he rode in the very heart of the historic and resourceful region in a palace car, which left the Missouri River less than two days before and conveyed its passengers with as much comfort and far less fatigue than is experienced in making the journey from New York to Chicago. The wonderful rapidity with which steel rails had been extended into this sparsely settled country of magnificent distances was not more marvelous than the many striking manifestations on every hand of an astonishing awakening from the slumber of two centuries, attributable to the inspiring and stimulating influence of railway lines, bringing the long-neglected Territory in close touch with the enlightened progress and fruitful modern methods of the Eastern States.

In the early history of the utilization of steam for transportation purposes it was supposed that a country must be settled and developed before it could support a railway, and those who projected new lines followed the great routes which internal

commerce had already established for itself and whose facilities it had outgrown. The pioneer railway builders sought to connect the large towns, and to secure a traffic already important and likely to grow. Soon after the close of the civil war this theory was abandoned, and the railway has since been the advance agent of civilization in the country. It has pushed out into countries that were almost destitute of population and which had not felt the stimulating influence of outside capital, following close upon the trails of Government exploring expeditions, whose reports of developed natural resources and descriptions of scenic and climatic attractions have been among its most important guides.

The men who have invested in the construction of most of the railways of the West have not done so because they believed the traffic of the regions through which they were projected was sufficient at the time to support the enterprises, but because they were persuaded that the roads would rapidly create a profitable volume of business for themselves. These remarks may be applied with peculiar propriety to the several lines of New Mexico. They have not only quickened the entire Territory into new life, attracting desirable immigration from all parts of the country, and giving a fresh and healthful impulse to all the useful activities of the people, but have actually created a large part of the traffic that is already making them more than self-supporting, and insures them large and steadily increasing profits in the future, thus satisfactorily demonstrating the wisdom of their projectors and affording substantial encouragement for the early construction of the important new lines projected in the Territory. Not one of the 10 railway lines in New Mexico is in the hands of a receiver, and after passing through the various trying vicissitudes inevitably incident to the development of natural resources, all of them have reached a point where they annually show net earnings.

Justly sharing in the general and unexampled prosperity of the entire Territory, including particularly the mining, lumber, stock raising, wool growing, agricultural, and horticultural industries, the railways of this region have earned larger profits during the past year than during any twelve months since the first locomotive whistled in New Mexico, about twenty years ago. And the future is bright with promise of richer rewards to come. The development of the magnificent possibilities of the Territory has so far only been initiated. When its vast and only partly explored mineral belts, carrying untold values in gold, silver, copper, lead, zinc, iron, and precious stones are systematically opened up and their riches rendered available; when its extensive Coal Measures, some of them still miles from railways, are worked to their full capacity and their product utilized in smelting and manufacturing plants; when its comparatively untouched forests of fine timber, such as are found in the Black Range and elsewhere, are placed within reach of enterprise by means of adequate transportation facilities and are united with its building stones and brick-making materials, boundless in quantity and unexcelled in quality, in structural work; when its immense and apparently inexhaustible deposits of salt, soda, alum, sulphur, gypsum, kaolin, and fire clay are accessible and brought into use; when the raising of blooded and graded cattle fully supplants the old range method and an approximation of the Ohio plan is adopted in the production of sheep and wool; when all its arable lands are placed under the magic touch of water and rendered fruitful by means of a general system of storage reservoirs and irrigation canals, the railways of New Mexico will enter upon an era of prosperity equal to that enjoyed by those that gridiron the great Commonwealths of Pennsylvania, Ohio, Indiana, and Illinois. These manifest possibilities will sooner or later be realized. The railways have already contributed immensely toward the development of the Territory. They will do more in the same direction each year.

POPULATION.

The census of 1850 credited New Mexico, which then included the Territory of Arizona and 60 miles of the southern portion of the State of Colorado, with a population of 61,547. In 1860 the same boundaries had a population of 87,034. The census of 1900 credited the same area with a population of over 400,000, a gain of nearly 600 per cent in fifty years; each year seeing a steady increase, each decade a substantial advance in population. In 1870 the Territory as constituted to-day had a population of 91,874; in 1880, 119,565; in 1890 it had 153,593, and in 1900 a population of 195,310. To-day the population in round numbers approximates 284,000, or over three times the population in 1860 and more than four times the population that New Mexico, Arizona, and 60 miles of the southern portion of the State of Colorado together had in 1850.

In character the population of New Mexico is at present divided almost evenly between native-born residents and residents who have come from the other States and Territories or are children of such. The native population has and is increasing steadily, but not at the same ratio that the population by immigration is increasing.

The native population in 1850 was about 55,000, while to-day it is about 140,000, including 13,000 Indians. The population born outside of New Mexico, and their children, in 1850 was about 6,000; to-day it is 144,000, and is rapidly assimilating the native-born population, of whom all but 20 per cent can speak the English language, the younger generation especially having adopted the language, the mode of living, and ambitions and ideals of the newcomers into the Territory.

The increase in population during the past decade was especially noteworthy, having been over 100,000, and that this rate of increase is being kept up, owing to the building of new railroads, the development of the Territory's splendid latent resources, and the better advertising of New Mexico's superb health-giving climate, admits of no doubt, and is borne out by registration, school census, and land-office statistics. The number of Indians in the Territory is 13,000, of whom about 9,000 are Pueblo, 1,000 Apache, and 3,000 Navaho. The increase in the number of Indians is very small. Of Afro-Americans, New Mexico has scarcely a thousand, and foreign-born residents make up less than 2 per cent of the population, German, English, and Irish predominating.

The population by counties is as follows: Bernalillo, 25,500; Chaves, 10,000; Colfax, 19,000; Doña Ana, 13,000; Eddy, 6,500; Grant, 12,500; Leonard Wood, 10,000; Lincoln, 10,000; Luna, 4,000; McKinley, 6,500; Mora, 13,000; Otero, 8,000; Quay, 4,000; Rio Arriba, 16,500; Roosevelt, 4,500; Sandoval, 12,500; San Juan, 6,500; San Miguel, 25,500; Santa Fe, 18,000; Sierra, 5,000; Socorro, 16,000; Taos, 13,000; Union, 6,500; Valencia, 18,000.

The population of the principal cities and towns is as follows: Albuquerque, 15,000; Las Vegas, 10,000; Santa Fe, 8,700; Raton, 8,000; Roswell, 4,200; Alamogordo, 3,500; Gallup, 3,200; Las Cruces, 3,000; Silver City, 3,000; Deming, 2,000; Carlsbad, 2,000; Ranchos de Taos, 1,800; Socorro, 1,500; Fernandez de Taos, 1,500; San Rafael, 1,500; Portales, 1,200; Lordsburg, 1,200; Tularosa, 1,200; Belen, 1,200; Santa Rosa, 1,200; Capitan, 1,200; Parkview, 1,200; San Marcial, 1,200; Tucumcari, 1,000; Los Lunas, 1,000; Tierra Amarilla, 1,000; Wagonmound, 900; White Oaks, 800; Bernalillo, 800; Hagerman, 800; Peralta, 800; Clayton, 800; Folsom, 750; Mora, 700; Cerrillos, 700; Springer, 600; Hillsboro, 600; Chama, 500; Espanola, 500; San Antonio, 500; Lumberton, 500; Puerto de Luna, 500; Watrous, 500; Elizabethtown, 500; Magdalena, 500; Santa Rita, 500; Pinos Altos, 500.

This shows that one-third of the population of New Mexico lives in towns of 500 or more inhabitants. In fact, almost 90 per cent of the population lives either in towns or village communities.

In the following counties the number of inhabitants of Spanish and Mexican descent predominate: Doña Ana, Leonard Wood, Mora, Rio Arriba, Sandoval, Socorro, San Miguel, Sante Fe, Taos, Union, and Valencia; while in Bernalillo, Lincoln, Colfax, Chaves, Eddy, Grant, Luna, McKinley, Otero, Sierra, San Juan, Roosevelt, and Quay, immigrants from the States and their children predominate, or both nationalities are about balanced.

Compared with the States of the Union, New Mexico is but sparsely inhabited, the census showing 1.6 inhabitants to the square mile, while the present population is about 2.3 inhabitants to the square mile.

Several of the counties are quite densely populated, such as Bernalillo, which has a population of 16 to the square mile, and Santa Fe County, which has almost nine people to the square mile. The more sparsely inhabited counties such, as Chaves, Eddy, San Juan, Roosevelt, Union, and Quay, are adding most rapidly to their population.

Here follow population statistics, by counties, as based upon the census returns of 1900:

Bernalillo County, area 1,567 square miles, is the most populous, the census giving it 28,630 inhabitants, that being, however, before part of the county was taken to create McKinley County and Sandoval County. This indicated a density of population of 3.25 people to every square mile. This, however, is only apparent, as almost one-half of the population is within a radius of 10 miles of the Albuquerque business section, and another fourth of the population lives in a narrow strip on both sides of the Rio Grande. The largest town of Bernalillo County and of New Mexico is Albuquerque, which the census credits with 6,238 inhabitants. To this must be added the population of Old Albuquerque, outside of the corporate limits, which the census gives at 1,191, and also parts of several suburban precincts. Albuquerque is the only incorporated municipality in the county. The Indian pueblo of Isleta has a population of 1,050. The present population of Bernalillo County is 25,500; density of population, 16 to the square mile; Albuquerque, 15,000.

Chaves County, according to the census, had a population of 4,773, of which 3,057 lived in the precinct of Roswell, the area of Chaves County being 9,599 square miles.

This is 2.4 square miles to every inhabitant. The city of Roswell, according to the census, had a population of 2,049. The settlement of Hagerman 400 people. The population of Chaves County is found almost altogether in the Pecos Valley, or the valleys of its tributaries. Since the census Chaves County has given part of its area to create Roosevelt County. Its present population is 10,000, or a little over 1 inhabitant to the square mile; Roswell, 4,200; Roswell precinct, 6,000; Hagerman, 800.

Colfax County, area 3,897 square miles, had a population of 10,150, or 2.75 people to every square mile. The population of the county is well distributed over the entire area, although 3,540, or more than one-third, lived in Raton, and almost another third within a comparatively small radius of that city. Raton is the only incorporated town in the county. Springer is second in importance, the census giving it a population of 558. Other towns are Elizabethtown, the precinct population of which was 577; Cimarron, 368; Blossburg, 187; Gardiner, 965; Maxwell City, 271; Colmor, 232, and Dorsey, 217. Present population of the county, 19,000.

Doña Ana County, 3,818 square miles, had a population of 10,187; but since the census has given up some of its area to form Luna County. The density of the population is a little over 2 per square mile, and one-half of the population is in Las Cruces and the settlements grouped around that town. The census gives Las Cruces a population of 2,906; Mesilla and Mesilla Park, 1,279; Dona Ana, 748; Chamberino, 579; Rincon, 276, and Organ, 259. With the exception of less than 1,000 people, the population of the county lives in the Rio Grande Valley. The present population of the county is 13,000, or a little over 3 to the square mile. Las Cruces, 3,000.

Eddy County, area 6,506 square miles, had a population of 3,229, of which 2,221 lived in Eddy precinct. The population is almost entirely in the Pecos Valley. There were more than 2 square miles to every inhabitant. Carlsbad, the principal town, has a population of 963. The present population is 6,500, or a little less than 1 to the square mile; Carlsbad, 2,000.

Grant County, area 7,403 square miles, had a population of 12,883, but since then has given up several precincts to the creation of Luna County, including the important town of Deming. In the census year there were 1½ people to every square mile, but one-half of the population was in Silver City and the mining camps around that place. The rest of the population was well scattered, except in the extreme southwestern part of the county, which is very sparsely settled. Silver City had 2,735 Inhabitants, and the precinct 2,971; Pinos Altos, 1,118; Central, 1,008; Santa Rita, 1,874; Lordsburg, the second town of importance in the county, 796. The present population is 12,500, almost 2 to the square mile; Silver City, 3,000; Santa Rita, 1,000; Pinos Altos, 1,000.

Leonard Wood County, area 3,952 square miles, had 5,429 inhabitants, or less than 1 person to the square mile. Since the census it has given up part of its area to form Quay and Roosevelt counties, and has received a small territorial accession from Bernalillo County. Its principal town at present is Santa Rosa, but at the time of the census it had only 247 people. Puerto de Luna precinct had a population of 1,097, and Anton Chico of 847; Bado de Juan Paiz had 515 people; Las Colonias, 417; Salado, 614; Fort Sumner, 200, and Endee, 288. But these latter are more agricultural and stock communities than towns. Present population 10,000, or a little over 2½ to the square mile. Santa Rosa, 1,200; Puerto de Luna, 500.

Lincoln County, area 4,954 square miles, had a population of 4,953, or 1 person to every square mile. Capitan, at the time of the census, was included in the precinct of Gray, with a population of 670. The town of White Oaks in June, 1900, the largest town, had a population of 804. Lincoln precinct, which includes the county seat of Lincoln, had a population of 1,065. Nogal had a population of 165. Present population of Lincoln County, 10,000, or 2 to the square mile. Capitan, 1,200; White Oaks, 800.

Luna County, created since the census of 1900; area, 2,946 square miles; population, 4,000, or 1½ to the square mile. The census gave Deming a population of 1,341. Present population, 2,000.

McKinley County, created since the census of 1900; area, 5,377 square miles; population, 6,500, or 1½ to the square mile. The census credited 2,946 people to Gallup and 1,525 to the Zuni pueblo reservation.

Mora County, area 2,542 square miles, was credited with a population of 10,304, showing a density of 4 persons to the square mile. The largest town is Wagon Mound, with a population of 895. Ocate precinct had a population of 1,100; Mora, 741; Cleveland, 615; La Cueva, 570; Tiptonville, 334, and Watrous, 244. Present population, 13,000, or over 5 to the square mile; Wagon Mound, 900; Mora, 700; Watrous, 500.

Otero County, area 6,870 square miles, had a population of 4,791, or about 1½ square miles to every inhabitant. One-third of this population lived at Alamogordo, which the census credited with 1,520 people, but which a municipal census on June 30, 1902,

gave 3,520. Tularosa had 752 population; La Luz, 444; Threerivers, 143; Fresnal, 317; Weed, 514; Jarilla, 100. There were also 534 Apache Indians on the Mescalero Indian Reservation. Present population, 8,000, or a little more than 1 to the square mile; Alamogordo, 3,500; Tularosa, 1,200.

Quay County, created since the census of 1900; area, 2,805 square miles; population, 4,000, or 1½ to the square mile. Tucumcari, 1,000.

Rio Arriba County, area 5,810 square miles, had a population of 13,777, being a little over 2 inhabitants to every square mile. This is well distributed along the water courses and in mining camps. The largest settlements are the twin towns of Tierra Amarilla and Parkview, which together had a population of 1,655. The most important railroad town is Chama, with 300 people. Monero is the principal coal mining camp, with 177 people. Lumberton had 465 people; Coyote, 366; Abiquiu, 551; Chamita, 404; Espanola, 665; Chimayo, 622, and Embudo, 789. Present population is 16,500, or almost 3 to the square mile; Parkview, 1,200; Tierra Amarilla, 1,000; Chama, 500.

Roosevelt County, created since the census of 1900; area, 3,110 square miles; population, 4,500, or 1½ to the square mile. Portales precinct in 1900 had a population of 353; to-day its population is 1,200.

San Juan County, area 5,598 square miles, had a population of 4,828, or 1½ square miles to every person. There are 1,747 Navajo Indians in the county on the Navajo Reservation. Farmington is the largest settlement, with a population of 548; Aztec, the county seat, had a population of 458; Laplata, 221; Fruitland, 397; Bloomfield, 246; Largo, 316; Flora Vista, 236; Blanco, 318, and Cedar Hill, 175. Present population, 6,500, or more than 1 to the square mile; Farmington, 750; Aztec, 600.

Sandoval County, created since the census of 1900; area, 3,959 square miles; population, 12,500, or 3 to the square mile; Bernalillo, 800. Indian pueblos: Santo Domingo, 772; San Felipe, 516; Jemez, 455; Cochiti, 295; Santa Ana, 228; Zia, 116; Sandia, 86.

San Miguel County, area 5,001 square miles, the second county in population in New Mexico, had 22,053 persons, of which one-fifth lived in Las Vegas and East Las Vegas. Las Vegas city was credited with a population of 3,552, but East Las Vegas precinct had a population of 3,574 and Las Vegas precinct of 2,767. Las Vegas Hot Springs had a population of 244; Pecos, 536; Chaperito, 379; Rowe, 391, and San Miguel, 450. Present population of county, 25,500, or 5 to the square mile; Las Vegas, 10,000.

Santa Fe County, area 2,160 square miles, had a population of 14,658, or almost 7 people to the square mile. Of this nearly one-half, or 6,897, lived on the Santa Fe grant, the population within the city limits being 5,603. Cerrillos is the second town in the county, the census giving it a population of 491 and the precinct 673. The other precincts are named after their principal and generally the only settlement, and had the following populations: Pojoaque, 798; Tesuque, 348; Agua Fria, 483; Cienega, 400; Galisteo, 726; San Ildefonso, 390; Dolores, 136; Golden, 323; Canoncito or Lamy, 505; Glorieta, 250; Chimayo, 319; Santa Cruz, 674; Espanola, 550; Madrid, 422, and San Pedro, 451. There are five pueblo villages in the county—Santa Clara, 223; San Ildefonso, 137; Nambe, 81; Tesuque, 80; Pojoaque, 12. A new town has been laid out at Kennedy, the junction point of the Santa Fe Central and the Atchison, Topeka and Santa Fe Railways. Present population, 18,000, or almost 9 to the square mile; Santa Fe, 8,700; Cerrillos, 700.

Sierra County, area 3,081 square miles, had a population of 3,158, or 1 person per square mile. Hillsboro, the county seat, is the principal town, its population in the census year having been 557. Other settlements were Monticello, population 391; Kingston, 284; Lake Valley, 215; Las Palomas, 225; Cuchillo, 200; San Jose, 172; Hermosa, 66; Fairview, 232; Engle, 142; Tierra Blanca, 105; Derry, 350; and Faulkner 219. Present population, 5,000, or more than 1½ to the square mile. Hillsboro, 600.

Socorro County, the largest county in the Territory, area 15,250 square miles, had a population of 12,195 or 1¼ square miles to each person. Socorro is the principal town in the county, with a census population of 1,512. San Marcial is the next town in importance, with a population of 1,018. San Antonio is next with 642 people. Other settlements are Kelly, 616; Magdalena, 300; Mogollon, 599; and Rosedale, 146. Present population, 16,000, or 1 to the square mile; Socorro, 1,500; San Marcial, 1,200; San Antonio, 500.

Taos County, area, 2,283 square miles, had a population of 10,889, or a little over 4 people to the square mile. This is well distributed over the county. The town of Taos has a population of 1,225; Ranchos de Taos, 1,407 and Taos Pueblo, 419. Tres Piedras had a population of 87; Red River, 208, and Amizet 22. Picuris Pueblo had a population of 98. Present population, 13,000 or 5½ to the square mile.

Union County, area 6,037 square miles, had a population of 4,528 or about 1½ square miles to each person. The principal town is the county seat, Clayton, with a population of 750. Then comes Folsom with 297 people. Since the census the

county has given up part of its area to the creation of Quay County. Present population 6,500, or more than 1 to the square mile; Clayton, 800; Folsom, 750.

Valencia County, present area 7,944 square miles, had 13,895 inhabitants or 1¾ persons to each square mile. The greater part reside in the Rio Grande Valley, in which the principal towns are located, viz, Los Lunas, 458; Belen, 673; Jarales, 848; Peralta, 561; Valencia, 455, and Tome, 985. Other settlements are San Rafael, which is now the largest settlement in the county, having doubled its population since 1900, 698; Cubero, 342; San Mateo, 322; Los Lentes, 380; Tajique, 318; Manzano, 649; Torreon, 472; Punta de Agua, 100; and the Indian Pueblos of Acoma, 1,492, and Laguna, 1,077. Punta de Agua, Torreon, Pinos Wells, and surroundings have increased considerably in population since 1900, owing to the building of the Santa Fe Central Railway through eastern Valencia County. Present population, 18,000, or over 2¼ to the square mile. San Rafael, 1,500; Belen, 1,200; Los Lunas, 1,000; Peralta, 800.

The following gains in population were made by New Mexico counties during the decade 1890 to 1900, according to the census, it being remembered that several counties like Chaves, Eddy, Otero, Guadalupe, and Union, which show the largest gains in population, were not in existence in 1890, and therefore no reliable statistics to show their satisfactory growth are at hand, and that Colfax, Mora, San Miguel, Lincoln, and Doña Ana counties lost considerable territory and population to create those new counties. Bernalillo leads in actual gain, it having increased 7,717 in population in the decade; then comes Socorro with a gain of 3,600; Grant, 3,226; San Juan, 2,938; Rio Arriba, 2,243; Colfax, 2,176; Santa Fe, 1,096; Taos, 1,021; Doña Ana, 996, and Valencia, 19. The counties that lost in population, mainly through giving up area and inhabitants toward the creation of new counties, are: San Miguel, 2,151; Lincoln, 2,028; Sierra, 427, and Mora, 314. Taking the percentages, San Juan County led in gain of population, it having gained 156 per cent from 1890 to 1900; then comes Socorro, 38 per cent; Bernalillo, 37 per cent; Grant, 33 per cent; Colfax, 27; Rio Arriba, 20; Taos, 10; Doña Ana, 10; Santa Fe, 8; Valencia, one-eighth of 1 per cent, while Lincoln County lost 29 per cent; Sierra, 13; San Miguel, 9, and Mora, 3 per cent.

If the present rate of growth continues, and there is no reason why it should not, and there is a probability of a much greater increase, since the National Government has embarked on the enterprise of reclaiming the arid West by means of irrigation and reservoirs, the population of New Mexico in 1910, will, at a conservative estimate, be 450,000, and composed of intelligent, enterprising, thoroughly American people, second to none in patriotism, culture, and progress. The granting of statehood to the Territory will undoubtedly result in an immediate influx of thousands of desirable settlers from the States, for statehood will mean to New Mexico the coming of more industries, more capital, progress, prestige, prosperity, and growth in population and wealth.

NEW MEXICO BAR ASSOCIATION.

By EDWARD L. BARTLETT.

The seventeenth annual meeting of this association was held in the supreme court room at the capitol building on the 7th day of January, 1903. The report of the secretary showed at that time 64 members, 22 of whom are nonresidents, 2 of them occupying judicial positions in Porto Rico and the Philippines, and 2 new members were admitted.

The president, Hon. W. B. Childers, United States district attorney for the Territory, delivered the annual address, which was a strong plea and a legal argument for the admission of New Mexico as a State. His views were unanimously endorsed by the association, and copies of his address were ordered to be printed and sent to each member of the United States Senate where the House bill for our admission was pending. At the request of the supreme court the association appointed a committee to prepare new rules of practice for it and the district courts, which labor was performed and a draft of rules submitted to the court for adoption.

The report of the treasurer showed there was $276 on hand, with no debts or liabilities. It owns quite a library of rare and valuable books and is generally in a flourishing condition, doing good work not only for the bar, but for the courts and the people.

In my report to you a year ago I gave a full résumé of what this association had accomplished since its organization in 1886.

The officers of the present year are as follows: President, A. H. Harllee, Silver City, N. Mex.; Vice-president—First district, E. E. Sidebottom, Santa Fe, N. Mex.; Second district, A. B. McMillan, Albuquerque, N. Mex.; Third district, W. A.

Hawkins, Alamogordo, N. Mex.; Fourth district, C. J. Gavin, Raton, N. Mex.; Fifth district, H. M. Dougherty, Socorro, N. Mex.; secretary, Edward L. Bartlett, Santa Fe, N. Mex.; treasurer, George W. Knaebel, Santa Fe, N. Mex.

FORT WINGATE.

By Gregory Page.

Fort Wingate is 15 miles southeast of Gallup, and about 3 miles south of the Santa Fe Pacific Railroad, which runs through the Wingate Reservation. This reservation would make one of the most eligible summer camps for the drilling of a body of troops that could be found in the whole country. It is one of the most desirable locations for a military post that could be found in the Territory. It is on the main line of one of our transcontinental railroads. There is abundance of pure water, the climate is salubrious, it is convenient to the Zuni and Moqui reservations, and in close proximity to the Navajo tribe which forms the largest body of nomadic Indians in the Southwest. The three tribes mentioned will probably number 30,000. Wingate is the only military post in New Mexico at present occupied by troops, and Congress wisely appropriated $75,000 for improvements to enlarge the facilities of the post for the accommodation of troops. None of this money is being expended and the post has been recommended for abandonment, according to Associated Press dispatches.

The people of McKinley County protest vigorously and unanimously against the removal of the troops from Fort Wingate and represent as follows: The Indian tribes referred to are not confined to their reservations, but roam at will over the country. The principal wealth of the Navajoes is in sheep, and by an unfortunate succession of dry years they have lost not less than 250,000 sheep in the last four years. It is an absolute impossibility now to prevent the stealing of sheep and cattle by Indians anywhere within the boundaries of McKinley County, the lives and property of herders, ranchers, and traders living in isolated places are unsafe. Four traders living in isolated places near the south line of the Navajo Reservation have been murdered within the last two years. With the usual accompaniments of barbarous atrocity commonly shown by Indian murderers, other traders have had to leave because of their desire to discover the murderers, and desirable locations for sheep and cattle ranches remain unoccupied through the fear of Indian depredations. The information we have received from the citizens of McKinley County convince us that the presence of troops at Fort Wingate is absolutely necessary for the protection of life and property in the neighborhood of these reservations and a grave mistake will be made if the troops are removed from Fort Wingate which will have the effect of endangering life, depreciating the value of property, and retarding the development of the country. We therefore strongly recommend that the money appropriated by Congress for the contemplated improvements at Fort Wingate be expended, and that the present facilities for the accommodation of troops be increased so as to accommodate six troops of cavalry, and so long as present conditions continue that the post be maintained at Fort Wingate.

The names of the murdered men and dates of the murders are as follows: Alex Morrison, July 11, 1901; Charles Kyles, ———; Emmet Pitkin, June 4, 1903; Juan Ensinas, July 4, 1903.

ARCHÆOLOGY.

By Edgar L. Hewett.

I.—Historic Archæology.

1. The old mission churches.—Foremost in interest and value in historic archæology are the old mission churches of the Franciscans. In every occupied Indian pueblo and at the site of almost every abandoned pueblo there is one of these monuments of those pioneers of Christianity and civilization, the Franciscan Fathers. Many of these are in an excellent state of preservation, while others are in ruins; every one is an object of historic interest.

In attempting to point out the great value of these ancient landmarks, I wish to make a comparison with those of similar kind in California. For the purpose of this comparison I will use as an illustration the Old Mission of San Diego, which is the oldest of the California missions. It was founded in 1769. It is almost a total ruin; only the front remains in a good state of preservation. The side walls are still standing, but no portions of the roof or interior remain. This is the most venerable and venerated historic monument in the State of California, and is annually visited by thousands of tourists. It has stood for one hundred and thirty-three years. It marks the beginning of civilization and Christianity in California.

In New Mexico, in the Pecos Valley, 35 miles west of Las Vegas, at the site of the abandoned pueblo of Cicuyé, stands the ruin of the old Pecos church. It is as well preserved as that of San Diego. It has stood for three hundred years. It was nearly two hundred years old when the San Diego Mission was founded. It was projected before the Spanish Armada was destroyed. It antedates the coming of the *Mayflower* and the settlement of Jamestown. All that I have said of the old Pecos church may be said of that at Jemez. They were built at the same time. The one at Quivira was founded in 1630, and is a fairly well preserved ruin. The churches at San Ildefonso and Santa Clara are in a complete state of preservation. They are nine years older than the oldest of the California ruins. The old San Miguel Mission in Santa Fe has been rebuilt. Its walls date from about 1650, the roof from 1694, or possibly a few years later.

These are only a few examples selected at random from the large number of ancient churches of equally great interest scattered over New Mexico. We have so many such historic landmarks that we almost forget to cherish them. It would be of great interest to the traveling public and of great use to future generations if some student of archæology would make a catalogue of these old churches, giving location and photographs of each, and compile their histories, while such a thing is still possible, from the annals of the church, the archives of New Mexico, and from Spanish manuscripts known to exist in Rome and Seville. Every such structure should be an object of the most jealous care on the part of the State, and every citizen should assist in their preservation.

2. The archives.—A most fruitful field for historical research is to be found in the archives of New Mexico. These are of three classes, which may be described as follows:

First. The records pertaining to grants and transfers of lands. These are to be found in well-preserved manuscripts in the office of the surveyor-general of New Mexico in the Federal building at Santa Fe. Many of these are translated, and all are accessible to students who wish to make proper use of them.

At first thought it may appear that this class of archives would be of little value in a historical way and of no use excepting in legal matters. Such is not the case. I am convinced that these manuscripts will be invaluable to historians. One is continually charmed with the naïve expressions found in these records, and with the facilities here afforded for connecting disjointed fragments of historical narratives, clearing up obscure incidents, and verifying traditions.

Second. Official documents pertaining to affairs of state, expeditions, etc.

These documents are now to be found in the vaults of the secretary of New Mexico, in the capitol building, and are now being well cared for. Unfortunately they have not long been thus cared for, and in consequence many valuable pages are missing. Vast quantities of these valuable manuscripts were wantonly destroyed some years ago, and there has been a continual waste of them until very recently, owing to the imperfect facilities for caring for them. They are for the most part untranslated. Many of them are known to be of great value. It is to be hoped that the translation of these can be accomplished speedily, and that they may be catalogued, assorted, and made available for the use of historians.

Third. The archives of the church.

Perhaps the best and most useful of all historic documents pertaining to the Southwest are the archives of the church. These consist in many instances merely of records of births, deaths, and marriages, yet they are of great interest as a means of identifying historic personages and verifying historic events. In some of them we have complete journals relating to the founding of the various missions; the numbers and conditions of the Indian tribes inhabiting the pueblos; the accounts of martyrs of the church who, in the early history of New Mexico, freely gave their lives for the propogation of the gospel.

The most voluminous and complete of these accounts were in very early times sent to Spain and Italy, where they are now preserved, and where they could be made accessible. Others are found in the records of the churches which are still in use in New Mexico; and still others, doubtless many of vast interest and value, may be found in the Indian pueblos, where they have remained an object of superstitious veneration on the part of the Indians from the times of the abandonment of the missions by the Catholic fathers.

America on the whole is exceptionally poor in archives. They have been wasted long before their value was thought of. New Mexico happens to be exceptionally rich in this respect, and it is hoped that early and vigorous efforts will be made to preserve the archives which are in existence, secure their translation by competent scholars, catalogue them for practical use, and make them in every way possible of interest and use to the public.

II.—Prehistoric Archæology.

New Mexico is preeminent in ruins of a prehistoric character. These are of two principal kinds.

I.—CLIFF HOUSES.

The cliff dwelling ruins are the most interesting on the continent. They are of two kinds:

1. Cliff dwellings proper.—These are houses built on high ledges under overhanging cliffs. They are closely allied to the ancient style of pueblo ruins. In these the back walls are formed by the natural cliffs, while the front and partition walls are of masonry, consisting of rudely dressed stone laid in adobe mortar and chinked with smaller stones in a manner almost identical with that of the pueblo ruins.

This type of dwelling is found in a number of localities in New Mexico, Arizona, and Colorado, the finest in existence being those of the Mancos Canyon and Mesa Verde, in southwestern Colorado. Vigorous measures are now being taken by the people of Colorado looking toward the preservation of these ruins, and the movement is deserving of every encouragement. It is only to be regretted that such steps were not taken earlier, before the dwellings were despoiled of their contents.

2. Cavate lodges.—These dwellings are as strictly cliff dwellings as are those above described. For scientific purposes the term cavate lodges has been invented to distinguish them as a distinct type. It would be best for popular use to retain the simple term cliff dwelling or cave dwelling. These dwellings are usually in high, and in many cases, almost inaccessible cliffs. In the earliest stages they consisted of natural caves, but with the development of the people occupying them their dwellings were improved. In their highest state of perfection they consist of wholly artificial caves in perpendicular cliffs. A doorway is hewn into the face of the cliff to a depth of from 2 to 5 feet. Then the excavation of the dwelling begins. A front room, circular, oval, or rectangular is dug out. It may be from 6 to 20 feet in diameter, according to the use for which it is designed. If for a sleeping room only, it is liable to be from 6 to 8 feet in diameter, with very low ceiling, often not over 4 feet. If designed for a kiva, it may attain to a dimension of 15 to 20 feet in diameter. Those designed for general living rooms are usually from 8 to 12 feet in diameter, with ceiling not over 6 to 7 feet above the floor. There are usually one or more smaller rooms connected with the main living rooms by very small doorways. These were probably used for storage. The interiors are usually plastered to a height of about 4 feet above the floor with adobe mortar. In some places there is considerable attempt at wall decorations. The outer doorways are small, often not to exceed 1½ by 4 feet.

II.—PUEBLO RUINS.

These are spoken of as pueblo ruins, not because they have been occupied by the Pueblo Indians in historic times, but because of their resemblance to the large terraced structures occupied by the living Pueblo people. The finest specimens of this class of ruins in existence are to be found in New Mexico, being very numerous in several parts of the Territory. They are built of sandstone, volcanic tufa, lava, and cobble stones, the material used in their construction depending upon the natural formations found in the vicinity where located.

III.—THE PAJARITO PARK.

One of the most interesting regions archæologically in New Mexico is that known as Pajarito Park. It is a tract embraced between the Rio Grande on the east, the Jemez Mountains on the west, the Rito de los Frijoles on the south, and the Chama River on the north. It is a park of great natural beauty, being for the most part a plateau of from 6,000 to 9,000 feet altitude, and deeply seamed with canyons. The western portion attains an altitude of over 10,000 feet in places, and is covered with a heavy growth of pine and spruce.

A considerable part of the tract is overlaid with volcanic tufa varying in thickness from 50 to 1,000 feet. In the northeastern part this is entirely eroded away. Throughout the north central part the tufa remains in long tongue-like mesas or potreras, which rise abruptly—in many places perpendicularly—to a height of from 100 to 500 feet. In the southern part the tufa extends to the river in a sheet of varying thickness, and here innumerable canyons are cut out by the mountain torrents. The face of the country thus presents many miles of almost perpendicular cliffs of yellowish and orange-colored tufa, and in these we find the cave dwellings in almost countless num-

bers. I have been engaged at frequent intervals since 1896 in exploring and mapping this region. A preliminary archæological survey has been the result. During the past four years parties from the New Mexico Normal University have spent considerable time during the summer vacations in exploring and mapping ruins. While the results of the work are still incomplete and unpublished, yet enough has been accomplished to show that this is one of the richest archæological fields on the continent. Many thousands of cave dwellings have been explored; the largest of the stone communal houses have been located and mapped. Hundreds of smaller stone ruins have been located and superficially investigated, and a small beginning has been made in burial mound exploration. Another interesting line which promises good results is that of photographing and sketching the pictographs or rock writings of the prehistoric inhabitants. These inscriptions are evidently the work of tribes far more remote than the immediate progenitors of the pueblos, who occupied these dwellings in comparatively recent times—that is, about three hundred and fifty years ago. Almost all of these inscriptions have been copied and are being worked up.

A fine group of pueblo ruins is situated on the Pajarito Park. These are the largest that have been found, some of them having contained as high as 1,200 rooms. They are not, however, in as good state of preservation as are those of the Chaco Canyon, having been abandoned much earlier. The largest and most interesting are Puye, Otowi, Tsankawi, Navakwi, and Tchrega. These have all been carefully mapped and measured, but very little excavation has been done. In the same region are several hundred smaller pueblo ruins, containing originally from 1 room up to 500 each. This class of ruins in the Pajarito Park are all built of volcanic tufa.

During the past two years the attention of the Interior Department has been drawn to this region, with the result that a special investigation of the matter was ordered, and, based on the results of this investigation, a recommendation made to the national Congress to set aside all of the Pajarito Park that is situated on Government lands as a "Cliff Dwellers' National Park." This recommendation was embodied in what was known as House resolution No. 14071, introduced by Congressman Lacey, of Iowa, and favorably reported by the Committee on Public Lands, to which it was referred. This bill provides for the preservation and protection of all ruins situated on the park. As far as can be learned it met with very general approval. It is greatly to be hoped that the measure will be again brought forward at the coming session of Congress this winter, and that favorable action may be had. Such action is greatly to be desired for the reason that during the past few years a considerable market value has become attached to all relics taken from the ruins of the southwest, and this has been quite an incentive to collectors, who have carried on extensive excavations for commercial reasons only, and who have not only destroyed much valuable material, but have also wantonly destroyed the buildings.

During the summer of 1902 Congressman Lacey personally inspected the ruins on Pajarito Park with a view to determining the extent and importance of the ruins. His trip embraced a visit to the cliff dwellings of Puye in the northern part of the park, to Tsankawi and Tchrega in the central part, and to the Painted Cave and the Stone Lions of the Potrera de las Vacas in the southern part. The most important results of Judge Lacey's visit will probably be a radical change in the proposed bill. Instead of proposing to set aside all of the lands inclosed within the boundaries of the park, the new bill will provide for the reservation and care of only such portions as have ruins situated thereon, with sufficient adjacent lands to amply protect the ruins, and with all necessary rights of way for public roads, etc. This will greatly reduce the acreage to be reserved and will remove what has been practically the only objection to the measure—that is, the withdrawal of a large tract from entry and settlement.

IV.—CHACO CANYON.

The most important work of the summer expedition from the Normal University during the summer of 1902 was the exploration and mapping of the ruins of Chaco Canyon, in San Juan County. They are in western New Mexico, near the Navaho Reservation. Here the prehistoric village Indians seemed to have attained their highest culture and development. There are 14 large stone buildings in the region, several of which are in the best state of preservation of any such ruins that are known. They are vastly superior in construction to any of the present occupied pueblos. In some the walls still stand to a height of 30 feet and include remnants of the fifth story. They have originally been from three to five stories high. They contained from 100 to 1,000 rooms each and were built of sandstone.

The most remarkable of these ruins are Kin Kale, Wejegi, Una Vida, Hungo Pavie, Chettro Kettle, Bonito, Tuba Kin, Peñasco Blanco, Pueblo Alto, Kin Klizhin, and Kimineola. Nowhere else is there such a splendid group of prehistoric build-

ings in a fair state of preservation. They are also the richest known in relics of prehistoric culture.

It will be seen from what has been said that in these three localities—i. e., Pajarito Park and Chaco Canyon in New Mexico and the Mesa Verde and Mancos Canyon tract in Colorado—we have the finest specimens and in the best state of preservation of the three classes of prehistoric ruins. In these three localities we may find practically every phase of the prehistoric culture of the Southwest. The Pajarito Park lies near the city of Santa Fe, and is easy of access in the northern part from Española, on the Denver and Rio Grande Railroad, in the central part from Buckman, on the same road, and in the southern part from Thornton, on the Santa Fe Railroad via Cochiti. The Chaco Canyon is difficult of access, being situated in the midst of an absolute desert. It is about 70 miles from Thoreau, on the Santa Fe Railroad, and about 120 miles from Durango, on the Denver and Rio Grande Railroad. It may also be reached in about four days' drive from Bernalillo. Because of the inaccessibility of the region, and the fact that it presents no other features of interest, there seems to be nothing to justify the creation of a national park to embrace the Chaco Canyon ruins. Because of their great archæological value they should, however, be fully protected from destruction and preserved for future scientific investigation. The ruins of Mesa Verde and Mancos Canyon are reached from Durango, Colo. I would strongly recommend that Congressional action be speedily taken with reference to the ruins herein described, and that this be immediately followed up with general legislation for the preservation of all the prehistoric ruins of the Southwest.

The recommendations heretofore made by your excellency and the honorable Secretary of the Interior and the Commissioner of the General Land Office with reference to these matters meet with the heartiest approval and support of the scientific and learned societies of the country, as well as of all public-spirited citizens.

ANCIENT AZTEC RUINS IN SAN JUAN COUNTY.

By Hon. GRANVILLE PENDLETON.

San Juan County is not bare of attractions for tourists. It is the site of the most ancient ruins, and has the evidences of the oldest settlements in the United States. The common histories of the United States give the earliest settlements of our country as those made along the shore of Florida and the Atlantic coasts, from St. Augustine, Fla., to Jamestown, Va., and along the coasts of New York and New England.

Long before the Pilgrim Fathers landed at Plymouth Rock, and hundreds of years before the Spaniards settled at St. Augustine, Fla., and hundreds of years before the building of the city of Santa Fe, with its old church now more than 300 years old, San Juan County, N. Mex., was inhabited with thousands of people who built cities, towers and temples, and who irrigated and tilled the soil and produced corn and other cereals and plants upon which they subsisted.

Their many ruins of ancient cities, with their deep wells used for water, and their six and seven story palaces with from 500 to 800, and some with as many as 1,200 rooms and apartments, are yet plainly visible in the fertile valleys along the La Plata, Animas, and San Juan rivers in San Juan County. Way out upon the dry plains on either side of the Chaco Canyon and in the valleys thereof are traces of an ancient semi-civilization, which antedates by far the oldest civilization mentioned in any history yet written of the United States or of the Western Hemisphere.

Many eminent scientists who have visited these ancient Aztec ruins during the past four or five years, have given estimates which show them to have been constructed by a semi-civilized people from 1,000 to 1,200 years ago. Near the town of Aztec, in San Juan County, is a most noted ruin or ruins, where was once an ancient city of many thousand people. Their big mansion or castle, with its 700 to 800 rooms or apartments, was from six to eight stories high, and was surrounded with many smaller buildings scattered over several miles of the valley. Indications are that it was a much larger city with many more people than we now have in the Territory. There are to be seen and traced with certainty their old irrigation ditches, which show that they were an agricultural people, for way down in the basements of these old ruins are to be found corn, both shelled and on the cob, some of it petrified on the cobs and other in vessels of pottery and stone. Here may also be found the bones of turkeys and turkey feathers, but no evidences of any other fowls. Their castles and six and seven story mansions are built of stone and mortar, with large wooden logs or beams, and all fitted with such skill and exact nicety,

proving that these people were skilled workmen in their time, who built without the use of ax or hammer or any tool of iron. Many of the stones, both large and small, are dressed to a fine polish, which indicates wonderful skill and ability considering the crude tools with which they were doubtlessly dressed.

Probably the most extensive ruins are those in and along what is known as Chaco Canyon in the southeastern portion of San Juan County, about 40 miles east of Aztec. Here, along this great canyon, which in years gone by must have been a running stream of water, are the greatest evidences of our prehistoric settlement in these valleys. Here these ancient Aztecs, as they are known and called, built on the higher mesas as well as in the lower valleys. There are evidences of ancient irrigation ditches and large canals, which irrigated large fields of crops including corn and other grains. Here the Aztecs had great cities, and in one or two different localities are plain stair steps cut out of solid stone walls up to the steep bluffs from 150 to 200 feet high, leading from the city below to the city on high, the cities being only from 1 to 2 miles apart. Within an area of about 5 by 3 miles in this canyon, there must have been a thousand years ago or more a population of 20,000 to 30,000 people, as indicated by the size and shapes of their houses and their rooms and apartments. Here in this particular locality, the Hyde Exploring Expedition has excavated many rooms and taken out many valuable relics, pottery, turquoise, and various other ancient relics.

The indications are that probably more than one thousand years ago the county of San Juan had as many people living within its borders as now live in the entire Territory. From whence they came or where they went is that unknown part of history which we may never know. One thing is certain, that next to the oldest irrigation along the valleys of the Nile in ancient Egypt, and near to the oldest inhabited places on earth by civilized people, are the evidences of irrigation and civilization, such as are found in San Juan County, N. Mex.

NAVAJO BLANKETS.

[From the Santa Fe Daily New Mexican,]

The collection of Navajo blankets has grown with such rapidity in the west during the past few years that the Indians have hardly been able to keep pace with the demand, and as a result prices have risen steadily, and the blankets have been imitated to some extent by eastern manufacturers of woolen goods. But the Navajo blanket is not susceptible of duplication, hardly of imitation. Besides being the product of only one tribe of Indians, and therefore unique in itself, it possesses mystic meanings which are fully as interesting as those of oriental rugs and tapestries. They are the expression of the Navajo's longing for the beauties of life, and they show that in the breast of the savage there have long dwelt ideals of art which find their best expression at the loom. The figure designs in the Navajo blanket are to the Indian as full of meaning as are the white man's statues and paintings. They are the expression of the highest form of Indian thought.

In order to aid the collector of Navajo blankets, as well as to give a history of the art of blanket weaving, U. S. Hollister, of Denver, has written a valuable and interesting handbook on the subject entitled "The Navajo and His Blanket." Mr. Hollister has spent many years among the Indians, and has given much time and attention to blanket weaving and collecting. In describing the weaving of the Navajo blanket Mr. Hollister says:

"The Navajos have no spinning wheels, though they are abundantly able to purchase them, and therefore their spinning is a slow process. For this part of their work they refuse all innovations, preferring to adhere to the methods that have come down to them through two hundred years. Spinning the yarn is done with a simple distaff, which is a slender rod about 30 inches in length and $\frac{1}{2}$ in diameter, tapered to a spindle point at each end. A circular piece of wood, 1 inch in thickness and 4 inches in diameter, with a hole in the center, is slipped upon the rod and fastened about 20 inches from the spindle end proper. This is all there is to the Navajo spinning appliance with which so much is accomplished; but by long practice they become very skillful in twirling it and drawing out the thread at the same time. When the thread is drawn out a sufficient length the motion is reversed and the thread wound upon the spindle, just as our grandmothers used to reverse the wheel for the same purpose.

"The yarn produced by the first spinning is too coarse and too loosely twisted to be of any use in weaving, and it is therefore unwound from the spindle and spun again, and will then answer for the coarse, woolly weave we sometimes see. But a

third spinning must be done before the yarn is in anything like fit condition to work into a fine blanket; and for extra fine blankets, or for warp, the reader may form some idea of the amount of work that must be done by the Navajo slave of the blanket.

"In getting ready for the work of weaving the first step, after preparing the yarn, is to construct the warp frame. This is made a little larger than the blanket to be woven and is of slender sticks lashed together at the corners. It is laid upon the ground, and the warp is wound upon it from top to bottom, the threads crossing in the center, and it is then ready to set in the frame. For this two posts are planted upright in the ground and crossbeams are lashed to them near the top and the bottom. At the top a moveable pole is held horizontally to the upper frame timber by a rope arranged spirally, so that by tightening or loosening the rope the pole can be readily raised or lowered. The upper bar of the warp frame is fastened to this pole by loops of rope, and all is arranged so that in starting weaving the upper end of the warp frame is about 12 inches below the top of the main frame. The lower end of the warp frame is now fastened to the lower bar of the main frame, the warp thus being drawn taut. The loom proper is now complete, the warp is in place, and everything is ready for the beginning of weaving.

"A stick wound with yarn takes the place of what our weavers call a heald. Twine is wound around it, taking in every alternate thread of warp, and when the heald is drawn forward it brings one-half of the warp threads with it, thus opening the warp for the more ready placing of the woof. They use no shuttle, the yarns of different colors being wound in balls, and these are passed back and forth between the warp threads in the same manner as the ordinary shuttle, excepting that they can not be thrown, but must be slowly worked along by hand. The Navaho woman carries a color along until the pattern demands a change, when the first ball is dropped, after having made a loop of the yarn to prevent its unwinding, and the next color to preserve continuity, and thus the process goes on, back and forth, a single thread at a time passed in and out through the warp, the woof being laid loosely to prevent the weave from drawing in at the sides. As the work progresses the yarn is beaten down in the warp by using a thin, hard stick as a batten, and the firmness of the weaving depends largely upon the use of the batten, the hard, almost waterproof, specimens indicating the conscientious application of this implement. This manner of weaving results in a single-ply fabric, the pattern being the same on both sides.

"Sometimes the main frame of the loom is dispensed with and the trunks of a pair of standing small trees are utilized in its stead. But this is of the most primitive form, and lacks many of the features of an approved Navaho loom, though it serves to illustrate the simplicity of construction that may be made to answer the purpose.

"While weaving, the squaw sits on the ground and weaves from the bottomupward. When the work has progressed so far that she can not reach it easily, the rope on the upper beam is loosened, as is also the top bar of the warp frame, permitting the latter to slide down on the frame sides to the proper position. It is now fastened again, the warp being drawn taut and the finished portion of the blanket sewn tightly to the lower beam of the main frame.

"The Navaho blanket is a gem of barbaric weaving. Of a startling combination of bright colors, it would be hideous except for the perfect harmony in the arrangement of the colors. There may be faults of weave, texture, or pattern, but never really a fault in the blending of colors. Blue, or black and white, are effectively used with colors in maintaining this harmony."

Some of the largest and best collections of Navaho blankets in the country are owned in New Mexico. Mr. Hollister says that the collection of Seligman Bros., of Santa Fe, is probably the most complete and handsome in the world. Another elegant collection is that owned by Col. Max. Frost, editor of the New Mexican. Mr. B. G. Wilson, of Albuquerque, possesses a collection of wide range, which includes many rare specimens.

Mr. Hollister's book not only thoroughly covers the matter of weaving blankets, but tells many interesting facts about the Navahos as a tribe. The book is finely printed and handsomely illustrated, and contains many pictures of blankets in their correct colors.

It is of great literary merit, shows thorough research and intimate knowledge of the subject. Mr. Hollister is evidently a close student of archæology, Indian folk lore, legends, and tribal myths. It is a valuable contribution to the history of the Navahos, the greatest Indian tribe in the Southwest. It will prove of material aid to the collectors of these beautiful specimens of Indian art, as well as of great interest to scientists, to students, and to all those desiring to know about the characteristics and history of the Indians of the great West.

MINING IN NEW MEXICO.

[From the Santa Fe Daily New Mexican.]

Waldemar Lindgren, an authority on geology and mineralogy, in a paper recently read before the American Institute of Mining Engineers, speaks as follows of New Mexico's gold production under the head of "The geological features of the gold production of North America:"

"Placer mining has been carried on in New Mexico by the Spaniards and Mexicans since the occupation of the country in the latter part of the sixteenth century. The amounts extracted by these old miners can not be estimated, but they were probably very large. From 1877 to 1900, inclusive, the Territory of New Mexico has produced $13,300,000 gold. The total production since 1860 is in all probability about $17,600,000. In 1877 the production was $300,000, which gradually increased to $1,000,000 in 1889. It gradually sank again to $400,000 in 1897, but increased from that period, so that the output for 1900 amounted to $800,000. The principal producing county is that of Grant, containing the deposits of Pinos Altos, but many other counties contain producing mines.

"Our knowledge of the geology of New Mexico is very fragmentary—more so than that of any other State or Territory. The numerous desert ranges which characterize the State usually show a folded and faulted Paleozoic series, flooded by enormous masses of tertiary lavas. In a recent paper Prof. C. L. Herrick states that gold occurs mostly in igneous rocks, and chiefly in andesites, trachytes, and rhyolites, the latter being the youngest. The basalts are barren. The andesite is stated to be the most productive formation. From the description mentioned, it appears, however, that the igneous rocks mentioned are only partly lava flows, and that a number of them clearly belong to the class of intrusive porphyries. There is no doubt a great similarity between New Mexico and Colorado, and it is to be expected that similar classes of deposits will be found. Most probably, then, the gold veins should be divided into a later post-Miocene propylitic series and an older division connected with intrusive porphyries. Cretaceous; but, on the other hand, a short distance north of New Mexico, in southern Colorado, the erosion has been so intense as to expose intrusive diorites of late tertiary lava flows. Beyond the point, then, that a certain number of the gold deposits of New Mexico are post-Miocene nothing further can be said with certainty.

The gold veins of Pinos Altos, in Grant County, occur in granitic rocks, and are connected with dikes. In depths the sulphides predominate and a little free gold is present. The production rose to $400,000 in 1900. In the Shakespeare district, south of Lordsburg, in the same county, large quartz veins in diorite contain auriferous sulphides. Another well-known gold mining district is that of the Mogollon Mountains, in Socorro County, which is said to contain free-milling ore between walls of porphyry or andesite. Sierra County contains low-grade ore deposits at Hillsboro. Bernalillo County affords at Cochiti large low-grade ore bodies in igneous rocks. In a recent description of the San Pedro district, in Santa Fe County, Messrs. Young and McCaffery show the existence of several cores of syenite porphyry intrusive in old sedimentary rocks. Gold quartz deposits as stringer leads and fissure veins cluster characteristically about the contacts. This is the most important old placer district in the Territory of New Mexico, and also contains the celebrated Ortiz vein, said to have been worked by Indians previous to the Spanish occupancy.

"In the absence of further knowledge it does not seem possible to divide the product among the different classes of deposits. It might be said that probably at least one-half of the output is derived from post-Miocene propylitic veins.

"The output of placer gold is now comparatively insignificant. The amount is from $20,000 to $70,000 a year. From 1865 to 1875 the placers were worked with considerable success, and probably yielded several millions of dollars. Small amounts of gold have been produced from copper ores in the San Pedro Mountains. Silver, containing possibly a little gold, is obtained from a belt of deposits of galena in limestone in the southern part of the Territory, near Cooks Peak, on the west side of the Rio Grande Valley.

"A steady increase in production has taken place during the last four or five years and prospecting operations have been very active. From this it would seem likely that a still further increase is to be expected during the next few years. The Territory is situated between the great producing regions of Colorado and Old Mexico. Practically every range in New Mexico contains abundant indications of the presence of precious metals, and many of them are certainly of the same post-Miocene propylitic type which is so prominent throughout the regions to the north and south. Thus, while the production has been small during the past years, the region is not

so well prospected but that valuable discoveries may well be made in many of the districts. On the other hand, it is true that the old and important district of Pinos Altos shows a lessened production from that of former years."

THE ONLY COURT OF ITS KIND IN THE WORLD.

[Judge Wilbur F. Stone, in the Denver Post.]

Justices of the Court of Private Land Claims.—Chief Justice, Joseph R. Reed, Council Bluffs, Iowa; Associate Justice, William W. Murray, Huntington, Tenn.; Associate Justice, F. I. Osborne, Raleigh, N. C.; Associate Justice, Henry C. Sluss, Wichita, Kans.; Associate Justice, Wilbur F. Stone, Denver, Colo.

The United States Court of Private Land Claims was created by act of Congress approved March 3, 1891.

The purpose and sole jurisdiction of this court is to consider and adjudicate the title to all the lands claimed to have been derived by grants from Spain and Mexico situate within the area ceded by Mexico to the United States under the treaty of 1848, known as the treaty of "Guadalupe Hidalgo," and the treaty of 1853, known as the "Gadsden Purchase," and comprised within the present States and Territories of Colorado, New Mexico, Arizona, California, Nevada, Utah, and Wyoming.

California, however, though included in the treaty cession, is not included in the territorial jurisdiction of this court, for the reason that soon after the admission of California into the Union a tribunal was provided by act of Congress to settle the Spanish and Mexican grant titles to lands situate in that State alone, and by that tribunal called a "commission," and with appeals and reviews by the United States district court of California, and the Supreme Court of the United States, these titles were settled between the years 1850 and 1865.

All the rest of the country was left without relief for over forty years after the treaty of Guadalupe Hidalgo, with its stipulations for the protection of such titles, until the creation of the Court of Private Land Claims in 1891.

In the meantime many private acts were passed by Congress to confirm and quiet title to some of these grants, but this was a very unsatisfactory mode, since it was wholly unjudicial, ex parte and in some instances unjust, acting less by the laws properly applicable than by the influences of favor or prejudice—confirming those grants which ought not to have been done and leaving unconfirmed those which ought to have been done. Besides, no claimant could secure such legislative confirmation of his title unless he had money enough to go to Washington, organize a lobby, fight or buy off blood suckers, and wield sufficient influence to get a bill through Congress for such purpose. So rank had this practice become that Congress discontinued it more than twenty years ago.

Meanwhile efforts had been made, beginning nearly forty years ago, to have Congress provide a court or some kind of tribunal for the settlement of these titles.

MIXING TWO CIVILIZATIONS.

The claimants and possessors of lands under such titles were constantly harassed by refusal of new settlers to recognize their claims. Colorado and New Mexico had begun to settle up rapidly by an invading army of immigrants—mostly Americans—from the old western States and the east, who knew nothing of "grants," and in their eagerness to "git to take up a 160 acres of land, like they could go back yander in Kansas and the Iaway," were disposed to treat all the country as belonging to "Uncle Sam" since the war with Mexico, and disregard the rights of claimants unless they could show that they had "preempted" not to exceed 160 acres under United States law. Hence these squadrons of tenderfeet sought to "take up" and "hold down" for themselves mines, farms, ranches and water rights by "squatting" on them wherever they were found not actually covered by habitations and cultivated fields, and even regardless of the latter where held in excess of the United States quarter-section tracts.

Even the local land offices of the Government did much to encourage these abuses. Not through ignorance, for every grant was notoriously well known, but from disregard of grant rights and lust for fees of the office, entries were allowed to be made upon grant lands the same as upon public domain, notably in southern Colorado and New Mexico, and of course squatters would preempt the best portions—those which were irrigable. This practice was made all the more aggravating when afterwards Congress, in confirming these grants which the United States never owned and had by solemn treaty stipulated to protect, provided that all such squatter entries, although illegal when made, should be excepted from the confirmation, and the grantee should be graciously allowed to select a like area where he could find it on some part of the

public domain, it might be in widely separated parcels miles away from his granted tract and of little value for any purpose; or he could, as provided in the act creating the present land court, accept pay from the United States at the price of $1.25 per acre for such excepted area, the latter in many cases being at the time of such adjudication worth from $25 to $50 per acre. It is proper to note that these outrageously unjust provisions were the result of legislation at the instance of the majorities of eastern members of Congress who knew no more of the geography, topography, climatic and physical conditions or the necessity for irrigation in the farther west than they knew of the moon, and seemed to care as little, presuming, if they cared to indulge in any presumption whatever, that all lands in these far western Territories were the same as those in the rainy, well-watered, and timbered regions east of the Mississippi River. Members from the few States in the country west of the Mississippi, and the voteless delegates of Territories, were helpless and could only beg but not demand from that class which Governor Gilpin was wont to characterize as "The —— salt-water tyrants of the Atlantic coast."

For twenty-five years efforts were kept up to secure relief by means of the creation of a proper tribunal for the settlement of these titles until new States west of the Missouri had been admitted sufficient to make a show of strength, and whose members, by securing the aid of members from the Southern States, finally succeeded in getting the Court of Private Land Claims established by the act which passed the last night of the last day of the last session of the Congress expiring at midnight of March 3, 1891.

Personnel and Purposes of the New Land Court.

It was gratifying that there was created a real court, not a hybrid cross between a board of arbitration and a coroner's inquest, like the old crude "commission" of California, but a court commensurate with the importance of its object and purpose, fully equipped and clothed with all the powers—within the scope of its jurisdiction—of the circuit and district courts of the United States.

The court was made to consist of five judges—a chief justice and four associate justices, appointed by the President of the United States, selected from different states in the Union, and confirmed by the Senate; an attorney to act on behalf of the United States, a clerk, an interpreter of the Spanish language, and a corps of assistants in every department necessary. The United States marshals of each State and Territory within the territorial jurisdiction are the executive officers to serve the process of the court, the same as in the other federal courts of the Government.

The salaries are ample, being the same as those of the United States district courts, and paid by the Government, together with necessary incidental expenses when in the discharge of official duties.

In consideration of the purpose of the court, and the importance and peculiar character of the subject matter of its jurisdiction, it was conceded by the members of the joint committee of the Senate and House which agreed upon the bill for final passage by Congress, that the court ought to be essentially nonpartisan in its make-up, and should be constituted so as to preclude the least taint or suspicion of party or political imputation, in order to inspire confidence in its integrity of decision when dealing with the vast property rights which had been the subject of good faith by treaty between two sister republics.

To this end it was suggested in committee whether it would not be wise to incorporate in the act a provision requiring that the persons to be chosen as justices of the court should not all be of the same political party. But Senator Edmunds, the chairman of the joint committee, remarked that such a provision would better be omitted as it might suggest the very thing to be avoided, and that he would himself represent the view of the committee to the President touching this point. This he did the next day after the passage of the bill, and the selection of the members of the court by President Harrison was considered in keeping with that view.

To avoid partisanship.

Three of the five justices of the court were from the Republican and two from the Democratic party. One of the Republican members was from a Southern and one of the Democrats was from a Northern State.

Four had served as officers in the Civil war—three on the Union and one on the Confederate side—and the fifth member had held the office of assistant United States attorney during the war.

In the matter of ability and judicial experience the personnel of the justices was considered compatible with the dignity and requirements of such a tribunal.

Chief Justice Joseph R. Reed, of Iowa, had served many years on the bench, including the supreme court of his State, and had served a term in Congress.

Judge Thomas C. Fuller, of North Carolina, was a great lawyer, of a family of lawyers, and a typical representative of the old school of chancery practitioners.

Judge William W. Murray, of Tennessee, had achieved distinction at the bar and had served many years as United States district attorney.

Judge Henry C. Sluss, of Kansas, had attained high rank at the bar and had served with distinction on the bench of that State.

Judge Wilbur F. Stone, of Colorado, had been one of the earliest pioneer lawyers of this territory, was chairman of the judiciary committee of the convention which framed the constitution of the State, and had served as one of the first judges of the Colorado supreme court.

The United States attorney for the court, Matt G. Reynolds, of St. Louis, Mo., is a lawyer of great ability, vigorous, aggressive, and untiring mentally as well as a physical athlete. He is a graduate of the Annapolis Naval Academy and served as an officer in the United States Navy in the Asiatic waters. As special assistant he has achieved distinction in prosecuting the cases on appeal in the Supreme Court at Washington and also rendered signal service by compiling and publishing a volume comprising the Spanish and Mexican law relating to land grants.

VAST SCOPE OF WORK TO BE COVERED BY COURT.

The Court of Private Land Claims is, as a court of this country, unique in character, and its establishment and work marks an interesting epoch in the history of the jurisprudence of the National Government.

In its purpose, jurisdiction, and functions it is unlike any other ever established in this country. Its function being, primarily, to determine the validity of title as between the United States and the grantee claiming under a foreign nation, it involves:

First, a legal interpretation of the terms of the treaties between the two governments.

Next, a consideration of international law, the civil law of Spain, founded upon the Roman civil law; the edicts, ordinances, and decrees of the Spanish Crown, reaching back two or three centuries, relating to the Crown possessions of the Indies.

Then the laws and statutes, Federal, departmental, and State, of Mexico subsequent to the independence of that Government in 1820.

Next, the restrictive provisions of the act of Congress creating the Court of Private Land Claims.

Then the decisions of the Federal courts of the United States in the review of cases involving similar questions arising in California and under the Florida and Louisiana purchases, and also involving somewhat of the customs, definitions, interpretations, and traditionary usages touching the estate and tenure of Spanish and Mexican grant titles; and

Lastly, such of the law of evidence, realty, descent, alienation, and equitable rights as are applicable under rules of judicial procedure in courts of the United States.

All the muniments of title, and which constitute the written or documentary evidence in these cases, are in the Spanish language, the oldest being known as "archive" documents or records. The translation of these requires the services of experts who have had years of experience as translators and custodians of the archives and are familiar with the script, nomenclature, and formula of these ancient legal documents and their forms of authentication and peculiar rubrics. These archives are on parchment or royal sealed paper, and the more ancient are full of abbreviations, like middle-age Latin.

Many laws and special statutes affecting these cases were found by the court never to have been translated into English, and during the busiest period of the court's work quite a little army of translators, chirographic experts, stenographers, typewriters, clerks, and special Government agents were required several years to assist in the preparation of cases for trial.

A ROMANTIC PAST.

An interesting feature of the business of the court is the historic romance attaching to the settlement and holding of these lands.

The documentary evidence in many cases had to be supplemented by the oral testimony of witnesses, relating to occupation, abandonment by Indian hostilities, heredity, and family pedigree of claimants, dating back to a time when witnesses

from seventy-five to one hundred years old testified to what, when children, they heard told by their aged grandfathers. Here were brought out the stories of the marches northward into the frontier provinces across arid deserts, over drifted sands, through prickly cactus, thorny mezquite chaparal, and under burning suns reflecting the blinding light from wastes of snow-white alkali, on and on to the welcome, pine-clad mountains with their cool streams and fertile valleys. Then the settlements, the building of the rude adobe and jacal dwellings, the little mission church with its venerated cross, the forts for defense, the pastoral life with flocks of sheep and cattle, and the oft contention over watering places—the life over again of the patriarchal age of Abraham and Lot. Then the hostile raids of the Indians, the massacres, captivities, flights, years of wars and persistent returns.

In these stories one could look back in fancy over the long trails these settlers followed and see the marches of the first Spanish invaders, the old Conquistadores, who, like the crusaders of the middle ages, clad in all the panoply of Spanish cavaliers, resplendent in the glamor of the conquest of a new world, rode forth from the "Halls of the Montezumas," on that long stretch of mountain plateau from the City of Mexico to El Paso del Norte, and thence up the Rio Grande to its mountain sources—a journey of nearly 2,000 miles—bearing the flag of Spain and the banner of the cross, the mailed warriors going before and the black-robed priests following behind, and with glittering pomp and holy zeal bayoneting, baptizing, and benevolently assimilating the natives, "de las Indias."

The old world has scoffed at the lack of interesting history in America. The history of the Atlantic colonies and Mississippi States has been immortalized by the novelists and poets, like Cooper and Campbell, in tragic and bloody song and story, but the greater romance in the drama of American history, touched upon by the pens of Prescott and the Spanish chroniclers, is spread over the sun lands of the trans-Missouri and Pacific half of the continent, now the graveyard of the mystic Toltec, the golden-templed Aztec, the peaceful Pueblos, and the fierce Apaches—the Bedouins of the American desert.

And now we are resurrecting the history of the Cliff Dwellers, rivaling in interest and antiquity that of the peoples of the Nile and the Ganges.

This reminiscence—seemingly digressive and far-fetched—is but fetched directly down from the real genesis of the subject-matter of the present Court of Private Land Claims.

RÉSUMÉ OF THE TWELVE YEARS OF ITS EXISTENCE.

Another unique feature of this court is that it is not perpetual or permanent as a part of the judicial system of the government. Created for the purpose of accomplishing a specific work, it follows that when that work is ended the court is to cease and become, in legal parlance, functus officio. The lifetime of the court was originally limited—as a first guess at probable sufficiency—to five years. It has from time to time been extended until it has been in operation nearly twelve years, and is now nearing the close of its business, and will likely finish some time next year.

The justices, together with the United States attorney for the court, were appointed in May, 1891, and soon after met in Denver and organized the court. They appointed as clerk of the court James H. Reeder, of Kansas, a talented and popular lawyer, and who has lately been elected judge of the district court at Hays City, Kans. The present clerk is Ireneo L. Chaves, of Santa Fe.

Sessions of the court were held in Denver in the Gettysburg Building for two or three years until most of the grants in Colorado were disposed of, while for New Mexico the court sits at Santa Fe in the commodious Federal building there, and in Arizona the sessions are held at Tucson and at Phoenix.

Another remarkable feature of this court worthy of mention is its vast territorial jurisdiction—the largest of any trial law court in the world.

The States and Territories it embraces comprise an area larger than Germany or France, and the judges residing in North Carolina and Tennessee, in attending sessions of the court in Arizona, travel farther than from London to Constantinople.

A brief mention of the cases determined up to this time will serve to show the amount and importance of the work done.

RESULT IN TOTALS.

The whole number of cases filed in the court for confirmation of title to land grants was 301.

These claims embraced altogether about 36,000,000 acres.

Of this number there have been confirmed up to the present, 87 grants, embracing about 3,000,000 acres.

Of the remainder, those which have been tried have been rejected as invalid, either by the trial court in the first instance, or by the Supreme Court at Washington on appeal.

The land of all grants finally rejected reverts to the public domain of the United States, subject to disposal under the public land laws of the Government.

Few cases are now left for trial at first instance, but as it requires about one year's time after a grant is confirmed in which to make a survey, be passed on by the surveyor-general of the State or Territory wherein situate, forwarded to Washington to be passed on by the General Land Office, and then returned to be finally passed on by the court—in which, if objections to the survey are filed by either party, the hearing thereon may involve a greater contest than the original trial of title—it necessitates the continuance of the court for probably a year after the last case in which a decree of confirmation is had shall have been tried.

Many of the most important cases required months to prepare for trial, and especially to defend on the part of the Government. Archives had to be searched and testimony taken in many places, not only within the Territorial jurisdiction of the court, but outside of it—at the City of Mexico, at Guadalajara, at Chihuahua, at Hermosillo, in Sonora, in California, and in Spain itself.

In securing such evidence one of the justices of the court had to go to these various distant places, accompanied with a retinue of interpreter, expert translator, stenographer, attorneys, and often a photographer to photograph Spanish records and boundary landmarks, in order to have such evidence properly authenticated. All this constituted another unique as well as highly interesting feature of this court.

Old Ruins and Relics of Old Times and Manners.

Old ruins were visited, as well as Indian pueblos and tribes; picturesque rocks and monuments with hieroglyphic landmark inscriptions were examined, and the kodak was strictly in evidence.

On one occasion, when sitting at Tucson—where the court in the midwinter months could sit in summer garb under the shade of palms and drooping pepper trees amidst blooming roses, oleanders, and pomegranates—the whole court with a party of about 40 persons went one day by special train 75 miles toward Tombstone to examine disputed landmarks near the Mexican frontier, and enjoyed a judicial picnic in January beside an immense spring of mountain waters under the shade of the evergreen live oak, walnut, and Palo Verde trees.

Occasionally the court room at Santa Fe would be enlivened by a squad of Indians who had journeyed thither from their distant pueblos as witnesses for their grant. These delegations were usually headed by the governor of their tribe, who exhibited great pride in striding up to the witness stand and being sworn on the holy cross, wearing a badge on his breast, a broad red sash round his waist, and clad in a white shirt, the full tail of which hung about his antarctic zone like the skirt of a ballet dancer, and underneath which depended his baggy white muslin trousers, a la Chinese washee-washee.

The grave and imperturbable bow which the governor gave to the judges on the bench in recognition of their equality with himself as official dignitaries, arrayed in that grotesque fashion, was enough to evoke a hilarious bray from a dead burro.

On one such occasion, when asked on the witness stand by General Bartlett, his attorney, to produce the United States patent to his land, the governor rose up, and with much fumbling, after the manner of a modern lady searching for her pocketbook, produced the precious titulo from the hidden recesses of a back pocket in his shirt tail! And yet, in his aboriginal innocence, he couldn't understand why the audience smiled so boisterously.

The court proceedings in important cases have often been made intensely interesting by reason of the presence of famous and brilliant members of the bar. Eloquent forensic arguments have been made by noted lawyers from New York, Chicago, Cleveland, St. Louis, Denver, San Francisco, Washington City, Texas, Old Mexico, and from the leaders of the able bar of New Mexico and Arizona.

In one of the noted Arizona cases a few years ago the trial lasted a month and was argued by six famous lawyers for nine days. Among these was the distinguished Senator Morgan, of Alabama, whose two days' argument could have been listened to with tireless interest for two days longer by the bench, bar, and crowded audience.

Many of the large grants which were not wholly rejected by the court were cut down in area, either by the restrictions of the act of Congress creating the court and the 11-league limitation of the colonization laws of Mexico or by the terms of the grant itself being found to be for less than claimed by the petitioners. A noted instance of the latter class was in the case of the Cañon de Chama grant, which had

been sold to an English cattle company as containing over 200,000 acres, but was found upon trial to be in reality a grant for only 1,500 acres in a narrow canyon.

Another case was the Petaca grant. This was claimed to be about 30 miles long and 20 in width, embracing nearly 100 square miles of pine forest. It had been bought by one of the Farwells, of Chicago, who established sawmills and lumber camps in the pineries, and for ten years shipped lumber by rail from Tres Piedres to the markets of Colorado and New Mexico, but had reserved the best portion of the pineries for future use. The court found that the original grant comprised only a paltry strip about 5 miles long and a few rods wide, embracing the little garden patches in the canyon of Petaca Creek, belonging to some poor Mexicans, who were made all the poorer by having the ownership decreed to them by the court. The great pineries yet untouched were turned over to the public domain of Uncle Sam, to be gobbled up by lumber poachers, who will take care that they cut off the best part first.

Among other noted grants rejected and cut down in area are the following:

The Bartolome Baca grant, south of Albuquerque, area claimed 500,000 acres; total rejected.

The San Miguel del Bado grant, on the upper Pecos River, west of Las Vegas; area claimed, 315,000 acres; all rejected except the irrigated farming lands along the river bottoms originally allotted to the Mexican grantee settlers.

The Gervacio Nolan grant, situate west of the Maxwell grant; area claimed, 275,000 acres; total rejected.

The Canyada de los Alamos grant, near Bernalillo; area claimed, 148,000; confirmed, 4,000 acres only.

The Ignacio Chaves grant, southwest of Santa Fe; area claimed, 243,000 acres; confirmed, 47,000 acres.

The Cochiti grant, including, as claimed, over 200 square miles, with the whole of the Cochiti mining district, and owned by Joel Parker Whitney, of Boston; confirmed a narrow strip of pastoral land outside the mining district.

The famous Peralta grant (of James Addison Peralta Reavis); area claimed, 12,467,456 acres, and covering all the best portion of the Territory of Arizona, and a fair slice of New Mexico; total rejected.

For years a common impression had prevailed that many of the Mexican land grants were wholly illegal, forged, and fraudulent, and that the court, upon investigation, would so find. On the contrary, it was found that such cases were extremely rare. In fact, only one case was proven to be entirely fictitious and fraudulent. That was the notorious Peralta Reavis case.

WHERE LAW WAS STRICT.

Quite a large number of grants were found to have been made by officials not having proper legal authority so to do, although the grants were made in good faith, and where the officials assumed an authority which they ignorantly supposed they possessed.

This arose chiefly from the frequent changes in the constitution and legislation of the government, and the great distance of the frontier provinces from the seat of the central government at the City of Mexico; so that a provincial governor would go on exercising his functions for months or a year before he could learn of a change in his authority. This was especially the case under Spanish rule, when the ordinances and decrees of the Crown, made beyond seas, could not be promulgated and made known to the viceroys in Mexico until after the lapse of a year or more.

Under such conditions many grants, made perhaps a century before the court was established, had existed with titles undisputed by the people and by the Government under which they were granted, and in strict equity were justly entitled to be held good, but had to be rejected by the court under the limiting provisions of the statute creating the court, which required proof of strict legal authority in the granting powers, and a rigid compliance with law in the form and manner of its execution.

FLOATING BOUNDARY MARKS TO INCLUDE MORE LAND.

A number of grants have had their boundaries stretched and areas marvelously expanded. But this has been done mostly by Yankee and English purchasers and not by the original Mexican owners. Where boundaries were made by natural landmarks, such as a "white rock," a "red hill," or a "lone tree," another rock, hill, or tree of like description could always be found a league or two farther off, and claimed to be the original landmark described in the grant documents. Thus it has been found—unofficially—by the court that, in the unparalleled climate and under the generous sun of the Rocky Mountains, not only does vegetation thrive and grow to

enormous size by irrigation, but that land grants themselves grow immensely—without irrigation.

An amusing instance of the uncertainty of Mexican land boundary description occurred in the case of the little grant of the narrow valley of Santa Fe Creek in the mountains above the city. The length was given as extending from—say—the old sheep corral of Jesus Maria Gonzalez up the creek to Monument Rock. The width extended from the bed of the stream to the "faldas" of the mountains on either side. Now, a "falda" in Spanish means primarily a skirt, as the skirt of a woman's dress.

The delicate question of just where are worn or situate the skirts of a mountain was argued before the diffident justices by the lawyers all one day, and much expert learning was deployed with legal technique in, on, about, above, and beneath the topographical skirts which depend from shoulders or the equatorial zone to the foot of a mountain.

A VERY DELICATE QUESTION.

T. B. Catron, attorney for the claimant, insisted that the faldas should be held to be up about timber line, so as to include all the valuable timber. Hon. W. H. Pope, the assistant United States attorney, contended that such elevation of the faldas was a highly improper interpretation, since it would fix the bottom of the said faldas so high above the foot as to expose the trunks and limbs of trees, after the fashion of the knee-plus-ultra skirts of a ballet dancer—a meaning never intended by the pious Mexicans; that the setting sun would blush upon such immodest mountains; but that, on the contrary, the term should be construed to bring the skirts down to the trails of the foothills, after the style of the decorous ladies who assist the street sweepers in gathering up microbes from the sidewalk.

The court, after thoughtful consultation in chambers, decided that a falda of the pattern of an average bicyle skirt was about the proper thing for mountain use, and so decreed the side lines to be surveyed along the upper edges of the valley—a little above the foot of the slopes—about the region of the calf pastures, at the lines of possible irrigation.

Result, a strip of land 10 miles long and averaging 10 rods wide, with corrugated edges conforming to the bottom fringes, ruffles, and convolutions of the allegorical skirts of the mountains.

GREATEST LAND SWINDLE IN HISTORY OF THE WORLD.

The Peralta-Reavis case involves a history which in itself would fill a volume, and that of the most romantic interest, but which can be only briefly epitomized in this article.

James Addison Reavis, a product of Missouri, when a young man was employed in the office of a lawyer in St. Louis who had much to do with the settlement of old Spanish grants in that State, and which business eventually brought him the case of a Spanish grant in Arizona. In the clerical work relating to it Reavis became familiar with this case, and upon the death of the old lawyer made a trip to Arizona in the interest of the claimant, who was an invalid in health and died a few months after reaching the Territory, leaving no heirs. Reavis seized the opportunity to succeed as claimant by manufacturing the requisite assignment of rights in the case. After working at it a year or two the subject grew upon the fertile mind of Reavis, and he conceived the idea of enlarging the claim so as to make it worth his while. He set to work and mapped out a plan for a grant on a gigantic scale. He went to Mexico and examined the Spanish archives at various places, and eventually went to Spain upon the same mission.

He took his time, cautiously, skillfully and alone, making no confidants. In brief, he manufactured and counterfeited a complete title for a Spanish grant of land as large as the State of Indiana, stretching from near the mouth of the Gila River in Arizona to its source in New Mexico, taking in the principal cities and towns of the Territory, with the valleys of the largest rivers. He was crafty enough to make the title run so as to leave no living heirs except a possible female child whose existence was unknown.

FINDING THE HEIRESS.

He went to California and roamed about in search of an heir to his ready-made grant. He finally met with a young Spanish or Mexican girl, an orphan, a waif, who had no knowledge whatever of her father, mother, family, or birthplace. Here was Reavis's chance. He cultivated the child, took her in charge, waited till she was old

enough to decently marry, then married her and disclosed to her that she was the only living scion of one of the noblest of the nobility of Spain, and the long-lost heir to the great Peralta grant.

The documents constituting the claim of title to the grant showed that it had been made by the Crown of Spain, King Ferdinand VII, to one of the highest grandees in the realm, with a name and string of titles a yard long, including the Order of the Golden Fleece, the Order of Charles III, etc.

Long before the land court was created Reavis had sought recognition of his title and its confirmation through the Federal courts, the Interior Department, and Congress, but to no avail, except to teach him the defects in title, which he afterwards supplied by fresh counterfeiting.

Meanwhile he had organized in San Francisco and in the East several large companies for irrigation and other improvements, in which he had interested capital, and soon had all the money he wanted.

Upon his last visit to Spain he perfected his counterfeiting and alteration of the official records, and procured certified copies in a manner to render his title complete and impregnable. These papers, when submitted to some of the greatest lawyers of the United States, like Roscoe Conkling, Robert G. Ingersoll, and James O. Broadhead, were pronounced invulnerable. This was true, prima facie, since these genuine authenticated copies showed that the title so existed upon the royal and official records of Spain and Mexico. Certified copies of recorded documents being admissible evidence in courts as well as the original records, Reavis never dreamed that a contestant would ever cross the ocean to "go behind the returns." Indeed, the United States attorney of the court, at the outset, was of the opinion that the only defense was to attack the genuineness of the heirship being in the wife of Reavis. The discovery of the falsification of records was rather accidental. For the work of preparing defense of this case, which it was impossible for Mr. Reynolds to do outside his duties in court, the then Attorney-General, Mr. Olney engaged the services of Mr. Severo Mallet-Prevost, a young attorney of New York'

DETECTION OF FORGERIES IN SPAIN AND MEXICO.

Mr. Mallet-Prevost (who was afterwards engaged with ex-President Harrison on the Venezuela commission at Paris), a gentleman of most agreeable manners, a born diplomat, and who knows the Spanish language as well as a native-born Castilian, was at work nearly three years on the Reavis case. In examining some records in Mexico his keen eyes detected some faint signs of alterations in the written lines. Following this clew, various records elsewhere, from which Reavis had taken copies, disclosed like alterations. Pages were photographed which brought out clearly the erasures and interlineations as stars are photographed which are invisible with the telescope.

Mallet-Prevost then went to Spain and discovered that all the records in the royal archives at Madrid and Seville upon which Reavis had constructed his title had been falsified in like manner. How he had managed to do all this and escape detection at the time is too long a story to tell outside of a Sherlock Holmes narration.

After the return and report of Mallet-Prevost he made a second visit to Spain, accompanied by Justice Wilbur F. Stone, under an order of the court, and armed with proper credentials from the Departments of Justice and State at Washington, and upon diplomatic arrangements made between the American minister and the Spanish Government at Madrid, they spent three months investigating and securing complete and authenticated proofs of the marvelous manner in which an ambitious and crafty Missourian had "shown" himself how to become the titular possessor of the "Ancient Barony of Arizonaca."

Upon the trial of the case it was clearly established that this alleged Peralta grant, with all the titles, dignities, pedigrees, and prerogatives of Spanish nobility thereunto appertaining were manufactured fictitiously from beginning to end.

No such grant was ever made by Spain; the orders of the Golden Fleece and the others claimed were never conferred on any person of the name of the alleged grantee; the royal seal of the Crown exhibited by Reavis was not the seal of Ferdinand VII, but of another King.

These are the gist of the resultant facts disclosed. The details are as romantic as a fairy tale of the Arabian Nights.

Here is a glimpse of a man who in poverty and obscurity conceived and executed, without confederates, a crime requiring marvelous ingenuity and sublime audacity, and which took him nearly twenty years to accomplish, by which he rose to affluence, traveled between the Pacific and the Atlantic in special cars, hobnobbed with millionaires and Government officials, retained a dozen of the leading lawyers of the

United States; had a country house on Staten Island and another on the Pacific coast; took his wife with him on his last visit to Spain, and decorating her with a string of high-born Castilian names (he himself taking the name of Peraltareavis), introduced her to the proud Spanish Court as the fourth baroness in line of an illustrious ancestry and the heiress of a barony as large as Spain itself. On the birth of his twin baron-lets he sent engraved cards of the occasion to the judges of the court who were to try his title; spent all his money before the case came on to be heard; whose lawyers, snuffing the stupendous fraud, deserted him as rats abandon a sinking ship; was too poor when the trial came on to hire the cheapest attorney, and defended—for he was then put on the defensive—his own case alone against the whole array of counsel for the Government; saw his claim rejected as a fiction and a forgery; was indicted for perjury and fraud, tried, convicted, and sentenced to the penitentiary, where he exchanged his baronial badges for the horizontal stripes of a felon.

A pathetic coloring is given to the finale in the picture of poor Mrs. Reavis, the whilom baroness, and who is believed to have been innocent of all blame, or even knowledge, of the imposition practiced by her husband, left without family or friends, and forced to resort to a mean tenement in one of the squalid streets of the city in which she was left, reduced to taking in washing to support herself and her handsome little twin boys.

In magnitude and in romance of crime no cause ever paralleled this in the civil jurisprudence of Christendom. The English Tichborne case dwarfs beside this of Jame Addison Peralta Reavis.

Quirk, Gammon, and Snap, the lawyers in Ten Thousand a Year, in order to sustain the fraudulent title of "Titlebat Titmouse," counterfeit a single tombstone. Reavis invaded a Catholic Church in California, laid hands on the parish record books of the priest, and counterfeited a record of marriage, birth, baptism, death, and burial.

The documents of title in Spanish, with English translations, illustrated with maps, plats, royal seals, and rubrics, genealogical trees, and photographs of ancient personages of the Peralta family, together with the oral testimony in the case, make two large printed volumes, on file in the records of the land court.

Throughout all and after he had served out his prison term Reavis retained his accustomed cheek and chic; and whatever may have been his inner sense of compunction or humiliation, he maintained the outward air of one who thinks with a pleasant chuckle of the good time he once had when he could sing:

When I was a lad I served a term
As office boy in a lawyer's firm;
I cleaned the windows and swept the floor
And polished up the handle of the big front door,
I polished things up so skillfullee
That I now have the title of a Spanish grandee.

CASES DISPOSED.

Whole number of cases filed in the Court of Private Land Claims for confirmation of title to land grants	301
Number of acres embraced in these claims	36,000,000
Number of these grants confirmed	87
Number of acres in the confirmed grants	3,000,000
Number of acres restored to the public domain	33,000,000

SOME OF THE LARGER CLAIMS.

	Claimed.	Cut down to—
Canyon de Chama	200,000 acres	1,500 acres.
Petaca	384,000 acres	5,000 acres.
Canyada de los Alamos	148,000 acres	4,000 acres.
Ignacio Chaves	243,000 acres	47,000 acres.
Bartolome Baca	500,000 acres	Nothing.
Gervacio Nolan	275,000 acres	Do.
San Miguel del Bado	315,000 acres	Narrow strip along upper Pecos River.
Peralta	12,467,456 acres	Nothing.
Cochiti	200 square miles	Narrow strip of pastoral land outside of mining district.

PART III.

In this part are included the reports of the United States officials in New Mexico, who acceded to the request for a report to be included in this volume.

The reports included under this heading are:

The annual report of the United States mines inspector for New Mexico.

The United States Court of Private Land Claims.

The public lands of New Mexico.

Report of the United States surveyor-general for New Mexico.

Report of the internal-revenue collector.

The forest reserves of New Mexico.

The National Sanitorium for Consumptives at Fort Stanton.

The United States general hospital at Fort Bayard.

The report of the New Mexico section of the climate and crop service of the Weather Bureau.

The Jicarilla Apache Agency.

The Mescalero Indian Agency.

The Navajo Agency.

The Pueblo Indian day schools.

The United States Indian industrial school at Santa Fe and the Northern Pueblo day schools.

The United States Indian school at Albuquerque and Southern Pueblo day schools.

Report of the superintendent of irrigation of the Pueblo and Jicarilla Indian Reservations.

ANNUAL REPORT OF THE MINE INSPECTOR FOR THE TERRITORY OF NEW MEXICO.

By Jo E. SHERIDAN, *Inspector.*

PRESENT CONDITIONS AND FUTURE PROSPECTS OF THE COAL-MINING INDUSTRY IN NEW MEXICO.

The coal-mining industry in New Mexico is assuming a prominent place among the most profitable of the varied resources of the Territory. As predicted in the last annual report of the United States mine inspector, the production of coal has increased largely during the past fiscal year, and the demand has exceeded the supply, notwithstanding the fact that the railroads of the west and southwest, which are among the largest consumers, have substituted oil, from the wells of California and Texas. for fuel upon 2,000 miles of railroad.

In McKinley County the producing capacity of the mines is far in excess of the demand. It is in this county that the competition of fuel oil is most felt. The cheap fuel oil of California has been substituted for coal upon the Santa Fe Pacific Railroad from San Francisco, Cal., to Seligman, Ariz., a length of 770 miles of road, and also upon the branch from Los Angeles to Barstow, Cal., 141 miles, and upon other coast lines where New Mexico coal was used, and oil is also used in many industries and for domestic purposes in many localities of California where coal was formerly used. And yet with this formidable competitor in the field of consumers the production of coal from McKinley County only shows a decrease of 3.8 per cent. This indicates that the settlement of the Territories of Arizona and New Mexico and development of their resources has created a demand which at present compensates for the lost markets to the railroads and in California, and which will in the near future furnish a home market for a large proportion of New Mexico's coal production.

The development of the vast mining resources of Arizona and old Mexico are largely dependent upon the cheap coal of New Mexico, and during the past year this was fully demonstrated by the mining and smelting companies of old Mexico and Arizona keeping agents in the New Mexico coal fields for the purpose of tracing

empty railroad cars in which to ship coal from the Territory to the mines and smelters mentioned above.

In all the counties except Colfax County there has been a slightly decreased production, but this is due solely to lack of transportation facilities and scarcity of miners. In the matter of transportation, the equipment of the railroads will soon be increased to sufficient capacity to supply the demand, and in addition to this, new railroads are being built, some of these roads, like the Santa Fe Central, opening up valuable coal fields hitherto neglected and undeveloped on account of lack of transportation facilities, but which are now certain to be valuable producing fields.

Scarcity of miners, too, was a factor in restricting the production at several of the coal mines in the Territory. This dearth of miners was due, to some extent, to the reluctance of miners, especially those with families, to go to new camps where conditions are unsettled and many comforts of older established camps are apt to be lacking. But all this has now changed, the new camps being improvements in many ways upon the older camps. The miners will soon recognize this fact and the coal mines of New Mexico will soon be supplied with a full quota of labor of all kinds.

Already the cheap fuel oil of Texas has ceased to be a competitor of New Mexico coal, except in the immediate vicinity of the oil wells, and the coal of New Mexico is again being used on the railroads, as well as in other industries of Texas, where a year ago oil was used as a fuel.

The following table shows the production, as also the increase and decrease, in the various counties:

Name of county.	Output for fiscal year ending June 30, 1902.	Output for fiscal year ending June 30, 1903.	Increase.	Decrease.
	Tons.	*Tons.*	*Tons.*	*Tons.*
Colfax	264,364	558,805	294,441	.....
Lincoln	121,902	98,096	.....	23,800
McKinley	561,436	539,910	.....	21,526
Rio Arriba	50,600	39,100	.....	10,900
Santa Fe	103,461	92,359	.....	11,102
Socorro	29,681	29,460	.....	221
San Juan	1,500	1,800	300	.....
Total	1,132,944	1,359,530	294,441	67,549
Deduct decrease			67,549	
Net increase			227,192	

Percentage of increase, 19.996.

Great strides have been made in the progress of the coal-mining industry in the Territory—far greater advance than is indicated in the mere percentage of gain in production. In the Colfax County field, at the Dawson mines, and at the Willow mines, there have been completed and put in successful operation two of the largest, best equipped, substantial, and most economical plants of machinery to be found in the United States. At the Gallup mine, in McKinley County, a similar, very efficient, and economical plant has been installed; at the Una del Gato mines, in Santa Fe County, and at the Carthage mines, in Socorro County, extensive development has been made and efficient machinery installed. All this means that capitalists and coal-mine operators foresee and recognize the importance of the coal industry of New Mexico in the near future, and are preparing to bring the production up to sufficient tonnage to supply the demand which will ensue.

Given ample transportation facilities and a sufficient number of miners, the New Mexico coal mines are to-day developed and equipped to quadruple the output, or produce 5,000,000 tons per annum, which can be easily increased to 15,000,000 or 20,000,000 tons, or ten times that amount with further increase of development and equipment.

For extent in area, thickness of coal seams, good roof and floor, absence of gas, freedom from creep, squeeze, and heaving bottom, absence of water, which if present would necessitate powerful pumps; in fact for all favorable conditions which go to make up a desirable coal-producing field, New Mexico is far ahead of any State or Territory in America, and consequently the coal fields can be more profitably operated.

Favored by location near the markets of old Mexico, Texas, Arizona, and California, as well as the local demand, in all of which markets New Mexico coal is protected from competitors by reason of distance of mines from markets and certainty of available supply, the future success of the coal industry in the Territory is assured.

DESCRIPTION OF NEW MEXICO COAL FIELDS.

The extent of the area underlaid by coal in the Territory of New Mexico can not be fully estimated until a geological survey is made. New localities are attracting notice each year as it is demonstrated by development that profitable coal fields exist therein.

During the past year there has been added to the known coal areas of New Mexico, by development, about 550 square miles. One of the fields is in Santa Fe County and comprises the Una del Gato mines, now opened to a depth of over 700 feet, and showing three workable coal seams of a good quality of coal, the veins being from 3½ to 4½ feet in thickness. In this field are also found the Coyote mines, and the Pinavititos extensions of the Una del Gato mines to the northwest, the outcrop showing for a distance of 5 miles or more. About 10,000 acres of the coal lands in this field has been filed upon during the past year, and a large part it purchased from the Government.

In Tps. 18 and 19 W., Rs. 4 and 5 N., in the southwestern portion of Valencia County, and northwestern section of Socorro County, a large area has been proven to contain good workable seams of coal 4 to 5 feet in thickness. About 20,000 acres of the coal lands in this field have been filed upon during the past year.

With new coal fields of such great extent being developed each year it is evident that it will require many years ere the full extent of the coal areas of New Mexico becomes definitely known, unless the United States Government shall have a geological survey made.

Hereinbelow will be found a brief description of the Coal Measures in the various counties of the Territory.

The McKinley and San Juan County coal fields comprise an area extending from the Zuni Buttes on the south to La Plata, on the Colorado line, 125 miles in a straight line. In width it will average 10 miles, giving a total area of 1,250 square miles, or 800,000 acres. This area is underlaid by several coal seams of good workable thickness, ranging from 3½ to 40 feet in thickness.

In the Gallup coal field, McKinley County, there are two series of coal seams known as the upper and lower Coal Measures. These Coal Measures are separated by about 400 feet of sandstone, slates, shale, and clays.

In the upper Coal Measures six coal veins have been exploited, and five of these proven to be valuable producing seams. Commencing with No. 1 vein, which outcrops near the Gallup and Weaver mines, the coal seam is found with varying depth of cover as due to the accidents of erosion. This vein is 6 feet in thickness, but mixed with bands of shale and bone, rendering it of little value in the immediate locality where exposed.

Passing down through 21 feet 5 inches of sandstone, fire clay, and shale we encounter No. 2 vein.

This vein is from 3 to 5 feet in thickness, is clean coal, and has a good sandstone top. Between this vein and the next below is 36 feet of sandstone, fire clay, and shale.

This seam, known as No. 3 vein, is never less than 4 feet in thickness, and frequently attains a thickness of 6 feet. The coal of this seam is of good, clean character, free from bone, and with a good sandstone roof and floor. This floor of hard sandstone is 6 feet in thickness, and below it lies No. 3½ vein. This vein is from 5 to 9 feet in thickness. In the Weaver mine this vein has been worked extensively, and has a good sandstone roof and floor.

Sixteen feet of sandstone intervenes between No. 3½ seam and No. 4 vein below. No. 4 vein has a thickness of 3 to 5 feet of coal, of good, clean quality, and has a good sandstone roof.

Below No. 4 vein 21 feet of sandstone, shale, and fire clay is passed through, when No. 5 vein, the bottom coal seam of the upper Coal Measures of the Gallup district, is found.

This vein where opened in the workings of the Gallup mine is never less than 5 feet in thickness, and in many places in the mine reaches 7 to 8 feet in thickness.

The Clark Coal Company's mine is also located upon these upper Coal Measures, but only one of the coal seams has thus far been explored in this mine.

Between the upper and lower Coal Measures of the Gallup district there occurs about 400 feet of sandstones and fire clays with a few small seams of coal.

The first or top vein of the lower series is known as the Crown Point vein. This vein is from 2½ to 6 feet in thickness, and has been developed in several different mines, embracing several miles of area. It has been worked in the Crown Point mine, the Thatcher, Otero, and Catalpa mines. The coal is of good quality and is clean.

The Thatcher or No. 2 vein of the lower measures lies next below the Crown Point vein and at varying distances from the vein above. In one part of the Catalpa mine the Crown Point and Thatcher coal veins lie close one upon top of the other, so that the parting can scarcely be distinguished. Six or 7 miles to the north in the Thatcher and Otero mines the same coal seams are about 35 feet apart. The Thatcher coal seam is from 4½ to 6 feet thick, and a good quality of coal. It has been worked in several mines of the district.

The Black Diamond, or No. 3 vein of the lower Coal Measures, lies about 40 feet below the Thatcher seam. It was worked extensively in the Black Diamond and Sunshine slopes, and is worked in parts of the Thatcher mine. This vein is from 5 to 7 feet in thickness and produces an excellent quality of coal.

The Otero, or No. 4 vein of the lower measures, is found at a depth of about 35 feet below the Black Diamond coal seam. It has been extensively worked in the slopes of the Otero, and the Rocky Cliff mines. It is from 3 to 6 feet in thickness and furnishes a good grade of coal.

The Gallup and Weaver mines, and the Clark Coal Company's mine, are opened in the upper Coal Measures, and all of the workable seams of both the upper and lower Coal Measures will be found in the areas controlled by these properties, but it will be centuries hence ere the vast reserves of coal in the upper measures will be exhausted, and it will become necessary to tap the lower Coal Measures in these mines.

There is considerable difference of opinion among local coal operators as to the identification of the several coal seams of the lower measures as found in the different mines, but from all the data obtainable the foregoing is probably a close approximate to the relative positions of the various coal seams.

Of course it must be taken into consideration that the coal seams as found in the one mine may be of contemporaneous origin with the coal seam that is called by the same name in another mine, and yet it may not be continuous between these mines, but may be segregated bodies of coal of identical age and origin.

It must be remembered that the basins or swamps in which these vast bodies of carbonaceous material were deposited, while on a scale of greater magnitude than the swamps of to-day, yet they were subject to like conditions of higher and lower localities within the whole basin, whereby the deposits were made on the lower ground or basins, and yet there was sufficient high ground to cut these several depressions off from each other, and thus segregate the different portions of what would have been one vast and continuous coal seam. This, together with such rolls and faults as are incident to the movements which have occurred in the earth's crust, would render positive identification of the several coal seams quite difficult in openings considerable distances apart in the different mines except by an expert geologist, who might be able to determine their relationship by some fossil or fossils peculiar to that seam alone and belonging in no other coal seam.

Herein above has been described the existence, and demonstration by development and production, of eight workable seams of coal of the most economical thickness for production of cheap coal, as seams having a thickness of 5 to 6½ feet have been proven to be the most profitable to operate.

Still below these at least one coal seam has been shown by diamond-drill boring to have a thickness of 5 feet. Borings show seventeen seams in all the upper and lower coal measures, nine of which are proven to be above 3½ feet in thickness and some reaching a thickness of 7 to 8 feet. When the market demands the product, all nine of the coal seams mentioned can undoubtedly be profitably worked. In fact eight of them are now, or were recently, being operated as the demand required, and it is highly probable that some of the remaining eight coal seams in this field will prove to be of workable thickness. But basing our estimates upon only one workable coal seam of an average of 5 feet in thickness, and assuming that the other veins will offset the area to be deducted for eroded canyons, faulted and broken ground, calculating 100 tons per acre for each inch in thickness of the vein, or 6,000 tons per acre, the number of tons of coal in this field would be 4,800,000,000.

The Colfax County coal field embraces an area commencing in T. 28 N., R. 19 E., and running thence northeast to T. 31 N., R. 26 E., a total length of about 45 miles, with an average width of 12 miles, or an area of 540 square miles, 345,600 acres. There are several coal seams in this field, two of which have been exploited and show an average thickness of 6 feet each. Basing the estimate of coal in the field upon one vein only, and offsetting the other by faults, rolls, and erosions which may be encountered in the other seam, calculating 100 tons per acre for each inch in thickness of one of these veins, we have as a result, for one vein of 72 inches covering the acreage above stated, a total of 2,488,320,000 tons.

Colfax County has advanced to first place among the coal-producing counties of

New Mexico. The increase of production in this county during the past fiscal year was 111 per cent, the mines of this county having produced 558,805 tons during the fiscal year.

The mines of this county are supplied with better transportation facilities than those in other counties of the Territory, there being two competing railroads into this section of New Mexico.

The Santa Fe County coal field is much disturbed, broken, and faulted by volcanic uplifts and overflows and igneous intrusions. Hence it is difficult to make even a close approximation of the workable area in this field. Commencing near the northern base of the Sandia Mountains, in Bernalillo County, running thence north about 20 degrees east, passing through disturbed and broken country, with segregated patches of coal lands for a distance of 25 miles, we reach the more compact, yet somewhat disturbed, section where are located the mines of Madrid and Waldo, generally known as the Cerrillos mines.

Along this course, as well as at Madrid and vicinity, are found isolated areas of an excellent quality of anthracite coal, much of it equal to the best Pennsylvania anthracite. These are sometimes of considerable extent, as at Madrid, where the Lucas mine, now known as the Cerrillos Anthracite, has been producing steadily for fifteen years; the product of this mine during the past fiscal year being 35,621 tons. At a depth of 2,600 feet in the slope the near approach of the igneous sheet, together with the action of the thermal waters, rendered the coal worthless; but a half mile farther east a drill hole has discovered what is in all probability a continuation of the same anthracite seam, the coal being of excellent quality and a thickness of 50 inches. The topography of this immediate vicinity would indicate that there is here an area of 2 miles square of unbroken and undisturbed ground in which would be found a valuable body of anthracite, containing in all probability at least a million tons. As the anthraciting of this coal is due to the near approach of the intrusive igneous sheet, and as the course of the intrusive is relatively erratic as to the distance maintained from the coal seam, the metamorphism has occurred in segregated sections, as the lava sheet intruded more closely to the coal seam. A reasonable calculation of the aggregate tonnage of anthracite coal which can be profitably mined from these sections would be 4,000,000 tons. Continuing our course—from the present center of operation of these measures—we find the field interrupted for a distance of about 15 miles by the uplift of the Glorieta range of mountains.

In T. 16 N., R. 12 E. the coal is again found, extending through an area of 15 miles in length and 6 miles in width, but considerably broken.

Estimating the distance from the north end of the Sandia Mountains in Bernalillo County, thence across Santa Fe County in a northeasterly direction to Porvenir, in San Miguel County, we have a total length of 50 miles, from which, deducting the interruption of the Glorieta Mountain range, there remains 35 miles in length by 4 miles in width, or 140 square miles. Allowing for the uncertain and broken condition 70 per cent of this territory as unavailable for profitable mining, there is yet 42 square miles of available coal lands. There are several coal seams underlying the major part of this area. At least two of these veins are of sufficient thickness to be profitably operated, having a thickness of from 3 to 4½ feet, with an average thickness of about 40 inches each. Again basing the estimate upon only one vein of 40 inches, the amount of available coal underlying this 42 square miles, or 26,880 acres, at 4,000 tons per acre, equals 107,520,000 tons. In such broken ground a positive and definite determination as to quantity can not be made, but it is certain that the above approximation is conservative. During the past six years over 1,000,000 tons have been produced from an area one-half mile square of this field, at Madrid, and from only one of the coal seams, the other being untouched.

The topography and geological features of the coal measures of Lincoln County are of such a character that the boundaries of the field are difficut to define. The country is broken and faulted, cut by igneous dikes, and in places the coal altered by action of lava sheets. While the area is quite extensive in which coal is known to lie, yet ground is so very badly broken and disturbed that much of it can not be profitably mined until prices are much higher and coal more scarce in other fields. It is uncertain, at best—any estimate which can be made of the available coal in these measures, but it may be placed at 5,000,000 tons so far as exploited. Borings may discover greater quantity, but a larger estimate at present would be unreliable.

The coal fields of Rio Arriba County embrace an area commencing at Azotea, a station on the Denver and Rio Grande Railroad, on the east, and extending west along the Colorado line to the San Juan River, which forms the northern portion of the western boundary line of the county, a distance of 40 miles in length by an average width of at least 12 miles south of the Colorado line. It is far more than prob-

able that these coal measures extend more than 12 miles to the south in many places. From a casual inspection of the formation it appears that these coal fields might be classed as an eastern division of the San Juan County coal measures, and are probably of contemporaneous origin. There are three coal seams in these fields, which are, respectively, 48 inches, 40 inches, and 36 inches in thickness. The 48-inch vein and the 40-inch vein have been worked to a depth of 1,200 feet and 600 feet on slope, respectively. Operation of the thicker seam was suspended because creeping of the floor rendered it expensive to keep entries open. Only the 40-inch seam is now worked. Computing the total area at 400 square miles, allowing one-fourth of area for interruption of formation by uplifts or dikes, there would be 300 square miles, or 192,000 acres. Basing calculation upon the one seam now operated, 40 inches in thickness, or 4,000 tons per acre, would show an available body of 768,000,000 tons.

Socorro County has heretofore only been credited with a coal-bearing area of 1,000 acres, but a very much larger area of coal land has been developed in southern Valencia County and northern Socorro County.

This area is estimated at 20 miles in length by 10 miles in width, or 200 square miles, about half in each of the counties named. The thickness of the coal seam developed runs from 48 to 66 inches.

At Carthage, near San Antonio station, on the Atchison, Topeka and Santa Fe Railroad, there are four producing mines in operation. The area of this field as far as developed is about 1,000 acres; thickness of seam, 50 inches; quantity of coal that can be mined, 5,000,000 tons. Add to this the field above mentioned, adjoining Valencia County, amounting to 100 square miles, or 64,000 acres, with an average thickness of one coal seam of 50 inches, or 5,000 tons per acre, which would give 320,000,000 tons, together with the Carthage field of 5,000,000 tons. As in the other fields adjacent to the Socorro-Valencia County fields it is far more than probable that there are several workable coal seams in this area.

On top of the Caballo Mountain Range, a few miles west of Engle station in Socorro County, are some patches of coal, but of little or no value, except as an indication that coal may underlie the extensive valley at the eastern base of the mountains. The coal here found is probably a continuation of the Carthage coal seams, and other parcels of coal land of valuable dimensions may be found in the intervening space.

Near Engle station, and upon the Salado Creek, are found isolated patches of coal, but thus far no producing mines have been developed.

For many years it has been current rumor throughout New Mexico that there were valuable coal fields in Valencia County, but it was on y during the past year that the value of these coal lands has been demonstrated. From reliable information obtained there are 100 square miles of valuable coal lands, being a part of the coal field and similar in every respect to that described above as extending south into Socorro County. This would give Valencia County an available supply of 320,000,000. There are said to be other valuable coal areas as yet untouched in Valencia County. Many thousands of these acres of this land have been filed upon as coal lands at the United States land office during the past year.

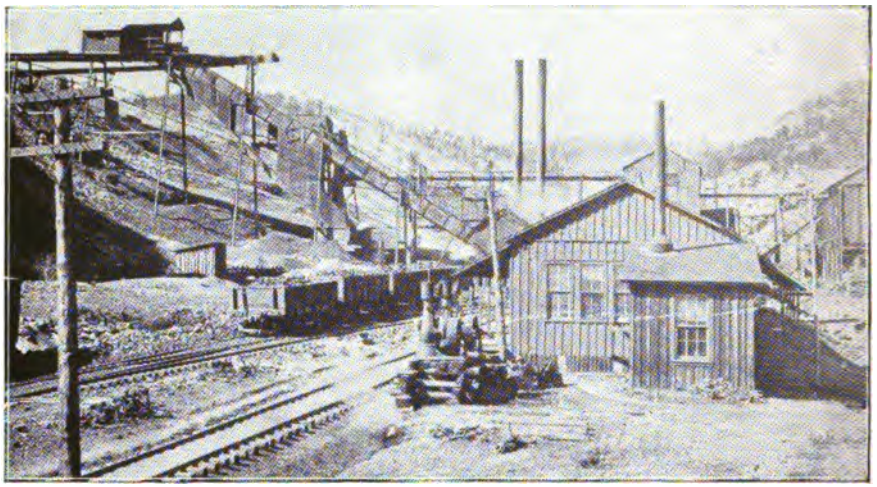
Summary of coal areas of New Mexico and available tonnage of coal which can be profitably mined.

Field.	Area.	Thickness of coal seam.	Tonnage available.
	Acres.	*Inches.*	
McKinley and San Juan counties	800,000	60	4,800,000,000
Colfax County	345,600	72	2,488,320,000
Santa Fe County	26,880	40	107,520,000
Lincoln County	.....	.....	5,000,000
Rio Arriba County	192,000	40	768,000,000
Socorro County	65,000	50	325,000,000
Valencia County	64,000	50	320,000,000
Total	1,493,480	.....	8,813,840,000

In addition to the coal fields above named there are several isolated areas of coal lands, but of undetermined extent.

In the vicinity of the village of Cebolleta and Chavez Mesa, in Valencia County, there are two workable seams of coal, one 4 feet and the other 5 feet in thickness.

Thousands of acres of coal lands have been located along the boundaries of Santa Fe and Bernalillo counties, and much of it entered at the land office at Santa Fe, but this is probably the area already credited to the Santa Fe County field.



COAL HOIST AND BREAKER AT GARDINER, COLFAX COUNTY.

COAL HOIST AND BREAKER AT MADRID, SANTA FE COUNTY.

There is a reported discovery of coal about 30 miles from Las Cruces, in Doña Ana County, near the Otero County line.

The Coal Measures of New Mexico occur in the Laramie Cretaceous sandstones, in many places uplifted and broken by igneous dikes, intrusive sheets, and by the disturbing influences of the more recent eruptive action of volcanoes, which has covered the Coal Measures with extrusive sheets of lava as on the Johnson and Barela mesas in Colfax County. But the larger proportion of the coal areas of New Mexico are comparatively undisturbed, and have every condition favorable to profitable coal mining.

As shown herein above present development would certainly indicate a total area of 1,493,480 acres of coal land in New Mexico, with a total available tonnage of 8,813,840,000 tons. Situated as these vast coal reserves are, near the median line between the diversified industries of the east and west coasts, it is quite apparent that they will soon play an important part in the commercial economies of the nation.

The industries of both coasts will be dependent upon New Mexico coal supplies for cheap transportation, which is necessary to the interchange of products between these aforementioned sections.

COLFAX COUNTY.

Colfax County during the fiscal year ending June 30, 1903, has taken precedence for the greatest coal production of any county in the Territory, with a gross output of 558,806 tons, a gain of 294,432, or more than double the product of the preceding year. The outlook for the coal-mining industry in this county is very bright, and if the present industrial activity and consequent demand for coal continues it is safe to predict an increase of 50 per cent in the coal production of Colfax County in the ensuing fiscal year. The new and extensive fields at Dawson, N. Mex., and at Van Houten, the latter known as the Willow mines, are as yet but in the initiatory stage of development. Development is being vigorously prosecuted in both these fields, and the machinery and equipment is being added to and improved as increasing production demands.

The mines above mentioned could within one year be developed to a producing capacity of 1,000,000 tons per annum, which production could again be increased to 4,000,000 or 5,000,000 tons per annum within four or five years, provided the demand and transportation facilities would justify the great expenditure for development and equipment.

DAWSON MINES NOS. 1, 2, AND 3.

[Dawson Fuel Company, owners and operators.]

The Dawson mines are located in the W. ½ of sec. 1, T. 28 N., R. 20 E., New Mexico principal base and meridian. The mines are situated about 35 miles southwest from Raton, Colfax County, N. Mex. The mines are owned by the Dawson Railway and Coal Company, 68 William street, New York City. Name of operator, Dawson Fuel Company, Alamogordo, N. Mex. W. P. Thompson, general manager, Dawson, N. Mex.; George T. Peart, superintendent, Dawson, N. Mex.

The Dawson Railway, a railroad built for the transportation of coal from these mines, connects with the Rock Island Railroad at Tucumcari, N. Mex., the distance being 168 miles. This railroad crosses the Atchison, Topeka and Santa Fe Railroad at French station, 18 miles east of Dawson; connection can also be made with the Atchison, Topeka and Santa Fe Railroad at this point, but at present there are no hotel accommodations for passengers who have to remain at French station awaiting trains on either of the railroads mentioned while en route to or from Dawson. A passenger coach is run upon the trains upon the Dawson Railway between Dawson and Tucumcari; from the latter station there is first-class railway accommodation either east or west.

There are known to be three coal seams of workable thickness in the Dawson Coal Measures. Only one seam is now worked, the thickness of which varies from 6 to 11 feet, with a thickness of 8 to 9 feet predominating. The thickness of vein in No. 1 mine is 11 feet, in No. 2 mine 8 feet. In No. 2 mine there is a shale parting 2 inches in thickness at about 2 feet from bottom of vein. The thickness of vein on No. 3 mine is the same as on No. 2, with similar conditions as to shale parting. The coal lies nearly horizontal, with little if any broken ground or disturbance of the formation. It is safe to presume that these workings are upon the same coal seam that is being opened by the Raton Coal and Coke Company in Spring Gulch, 12 miles north. The Dawson Fuel Company owns over 21,000 acres of land in the inter-

vening space between the Dawson mines and the Willow mines underlaid by this great coal vein, as well as many other seams, some of them being of good workable thickness. The system of working is by triple main, drift entries, double-cross entry, room, and pillar. The main adits upon each of the mines Nos. 1 and 2 have attained a length of 2,000 feet each. The mines are at present ventilated by means of two 24-foot Vulcan fans, with a capacity of 235,000 cubic feet of air per minute each. Electricity is used for motor haulage inside the mines and from the mines to the partings outside. The haulage from the mines to the tipple is done by two 30-horsepower Porter locomotives. Six steam engines are in use upon the property, with a total capacity of 1,000 horsepower, as follows: Generator engine, 350; washer, 300; box-car loader, 100; screw, 25; electric light, 25; fans, 150; pumps, 50; total, 1,000 horsepower.

Between mines Nos. 1 and 2 is located the electric power house. The building is frame, 60 by 30 feet in dimensions. The plant consists of two (General Electric Company) direct-connection generators, combined efficiency 240 kilowatts; voltage 250, 1,000 ampères. Electric power is used to operate the coal-cutting machines, of which eight are in use; three Sullivan machines, with a capacity of 150 tons each per day of eight hours, and five Jeffrey machines, with a capacity of 100 tons each per day of eight hours. Four Jeffrey motors are in use for haulage from the mines to the parting outside; total capacity of four motors, 2,000 tons per day. In capacity, improved appliances, and economical methods this plant is unsurpassed by any in the West, and only in capacity can it be considered as second to any coal-mining plant either East or West. To enumerate a part of these improvements and equipment the following are the more important: A double trestle with two tipples and two chutes for loading railroad cars. In connection with the tipples there are stationary and shaking screens for sizing coal for domestic and other purposes; also moving slate-picking table. Alongside the tipple and chutes is located the washery, where slack or other coal is automatically transferred from the screens and chutes, washed, and loaded into the lorries to be dumped into the coke ovens situated within a distance of a few hundred yards from the washery. The washery has a capacity of 1,000 tons in ten hours, and is equipped with 16 jigs and the necessary auxiliary machinery to operate them. The power for operating this plant is furnished by two sets of Stirling boilers of a combined efficiency of 500 horsepower. The power to operate the box-car loader and charge the coke ovens is furnished from the same source. One hundred coke ovens are already completed and more are being built as rapidly as possible, the foundations and stonework having been completed some time ago. Near by is located the blacksmith shop, built of iron, dimensions 70 by 30 feet. This shop is equipped with lathes, emery grinder, electric drilling machine, bolt and pipe-cutting machinery, and blower of ample capacity to run four forges. This department is in condition to do all ordinary repair work. Power to run this machinery is provided by a 25-horsepower General Electric Company's motor. The tipple, washery, coke ovens, etc., just described are located about 1¼ miles south of the mines, the town which is incident thereto being named Eddy, after C. B. Eddy, one of the principal promoters of this great enterprise. At this point also are located the carpenter shop, 30 by 40 feet; storage building, 30 by 60, and numerous tenement houses. About 2 miles north of Eddy and near No. 1 mine is located Simpsonville, so called after one of the principal owners in the company. Here are located many commodious dwelling houses, built upon modern and pleasing plans of architecture. Several of these buildings are boarding houses. These houses are all built much after the style of suburban-home architecture, pleasing to the eye from without and having modern improvements within.

Dawson is the name of the town, 2 miles south of the mines, where the general offices of the company are situated and where the residences of the superintendent and other officials are located. The town lies in the beautiful Vermejo Valley, which is irrigated by the crystal waters of the Vermejo River. On either hand are seen orchards, which in spring fill the air with the fragrance of their blossoms and in fall are laden with luscious fruits, while the prevailing gentle winds come down the canyon pregnant with the perfume of the pines which adorn the eroded canyons and the table-topped sandstone hills upon all sides. Deer and wild turkey are to be found within 5 miles of the town, and mountain trout disport in the waters of the Vermejo River, which runs alongside the town. In this ideal location is situated the headquarters of the Dawson Fuel Company. Here is located the principal mercantile establishment of the camp, owned by the Southwestern Mercantile Company. The building is 90 by 72 feet and of more than ordinary architectural beauty. A branch store is located nearer to the mines. Here also are located the pumping plant and waterworks. An abundance of pure water is obtained from the Vermejo Valley. The waterworks plant consists of a Cameron pump, 20 by 30 by 10 inches.

The power is supplied by one 60-horsepower tubular boiler and one 40-horsepower Scotch marine boiler. Water is conveyed to different parts of the mines and operating plants by pipe line, and the same mains convey water to all the houses for domestic purposes. This coal-mining enterprise, as a whole, is a remarkable one by reason of the celerity with which it was initiated, installed, and put in successful operation.

Average number of men employed outside, including coke ovens and washery, 150; average number of boys employed outside, 4; average number of men employed underground, 300; average number of boys employed underground, 6. Nationalities to which the men belong: Austrians, Finns, Italians, Mexicans, negroes, English, Welsh, Irish, and American. Percentage could not write, as denoted by signatures to vouchers: Mexicans, 20 per cent; negroes, 10 per cent; about 5 per cent of the other nationalities could not write. Number of days mine was operated during fiscal year, 286. Gross output for fiscal year (June 30, 1902, to June 30, 1903), 243,579 tons; amount used in operating mines, 3,600 tons; net product, 239,979 tons. Estimated value of output at mine, $287,974.80. The coal is marketed at Tucumcari, N. Mex., and at El Paso, Tex., and is shipped over the Dawson Railway, Chicago, Rock Island and Pacific Railroad, and El Paso and Northeastern Railroad.

The demand for coal from these mines was far in excess of the production, which was restricted by scarcity of miners and to some extent by lack of transportation facilities in the earlier part of the year. In addition to the coal, there was shipped as a product from the mine 18,074 tons of coke, of an estimated value at the ovens of $54,222.

Two more openings are being made upon this coal field, which will add considerably to the producing capacity of the Dawson mines. The coal will be run over the same tipple now used.

Many important improvements have been made during the past fiscal year, including additions to the electric and steam equipment, motors, fans, etc., together with several hundred new dwelling houses.

The prospect for a greatly increased production from these mines during the coming year is very good.

RECORD OF INSPECTION.

September 13, 1902.—Inspected Dawson mine No. 1. Air intake, 3,000 cubic feet per minute; air well distributed to working faces; 37 men employed underground. The volume of air traveling in the mine was less than the minimum quantity allowed by law, but the operators have now en route a fan of ample capacity which will soon be installed. Air fairly good at working faces. Mine in good condition, with exception noted above. No dust, no gas; mine well timbered.

November 17, 1902.—Inspected Dawson mine No. 1. Air intake erratic and unreliable; foundations for large fan being prepared. Present ventilating current produced by furnace shaft. Instructed that fire in furnace be increased to improve ventilation; 65 men employed underground. Found mine in good condition except as to ventilation. No dust, no gas; mine well timbered.

February 16, 1903.—Inspected Dawson mine No. 1. Air intake erratic and uncertain; ventilation weak and below legal limit, but large fan nearly ready to operate; 40 men employed underground. Found mine in good condition except weak ventilation. No gas, no dust; mine well timbered.

April 17, 1903.—Inspected Dawson mine No. 1. Air intake, 20,100 cubic feet per minute; air well distributed to working faces; 60 men employed underground. Found mine in excellent condition. No gas, no dust; mine well timbered.

June 24, 1903.—Inspected Dawson mine No. 1. Air intake, 6,000 cubic feet per minute; 91 men employed underground. Found fan running only 14 revolutions per minute; ventilation below legal limit. Notified Supt. George T. Peart of defective conditions. He informed me that slow motion of fan and consequent weak ventilation was due to lack of power while some necessary minor repairs were being made on boilers, and that repairs would be completed within an hour or two and then ventilation would be increased. Found mine in good condition. No dust, no gas; mine well timbered.

DAWSON MINE NO. 2.

RECORD OF INSPECTION.

September 11, 1902.—Inspected Dawson mine No. 2. Air intake, 6,200 cubic feet per minute; air well distributed to working faces; 40 men employed underground. Found several rooms in which the miners were lax about timbering sufficiently close

to face of room. Instructed that such rooms be safely timbered. Mine otherwise in good condition; no gas; no dust; ventilation good.

November 18, 1902.—Inspected Dawson mine No. 2. Air intake, 3,980 cubic feet per minute; 60 men employed underground. Volume of air below legal limit, but fan being installed. Mine otherwise in good condition; no dust; no gas; mine well timbered.

February 14, 1903.—Inspected Dawson mine No. 2. Air intake, 6,700 cubic feet per minute; air well distributed to working faces; 80 men employed underground. Volume of air less than legal limit, but the operators are using utmost diligence to install large fans, which will soon be in operation on each of the mines and supply an abundance of air. Found mine in good condition; no gas; no dust; mine well timbered.

April 16, 1903.—Inspected Dawson mine No. 2. Air intake erratic and unreliable; one measurement with anemometer gave 9,600 cubic feet per minute, while other measurements gave from 1,000 to 3,000 cubic feet per minute. This condition will soon be remedied, as a large fan will be put in operation on the 19th instant, when there will be ample ventilation; 58 men employed underground. Found mine in good condition; no gas; no dust; mine well timbered.

June 25, 1903.—Inspected Dawson mine No. 2. Air intake, 17,100 cubic feet per minute; 88 men employed underground. Air well distributed to working faces. Found mine in good condition; no gas; no dust; mine well timbered; ventilation good.

DAWSON MINE NO. 3.

RECORD OF INSPECTION.

September 15, 1902.—Inspected Dawson mine No. 3. Air intake, 6,750 cubic feet per minute; air well distributed to working faces; 24 men employed underground. Found mine in very good condition; no dust; no gas; mine well timbered; ventilation good.

November 19, 1902.—Inspected Dawson mine No. 3. Air intake, 10,500 cubic feet per minute; air well distributed to working faces; 50 men employed underground. Found mine in very good condition; no gas; no dust; well timbered; ventilation good.

April 18, 1903.—Inspected Dawson mine No. 3. Air intake, 14,000 cubic feet per minute; air well distributed to working faces; 32 men employed underground. Found mine in very good condition; no dust; no gas; mine well timbered; ventilation good.

BLOSSBURG MINE NO. 4.

This mine is one of the oldest producing coal mines of New Mexico, and has probably a greater tonnage of coal produced to its credit than any other mine in the Territory. The workings are the most extensive, the operation of the mine dating back to the advent of the Atchison, Topeka and Santa Fe Railroad. The coal seam throughout a large area of these workings was very uniform, ranging from 6 to 8 feet in thickness, and free from bone or rock. During the past year low coal and broken ground has been encounted in nearly if not quite all of the headings, and operation of the mine was indefinitely suspended. It is altogether more than probable that large areas of thicker coal exist at no great distance from the present workings; but the company operating the mine have vast tracts of land within 20 miles of this mine, upon which extensive outcrops of good coking coal are open to view, these seams being 8 to 10 feet in thickness, and the coal clean, and the ground apparently undisturbed. Mines are now being opened in some of these coal seams, and these new mines will produce greater tonnage of coal than has been possible to produce from the old No. 4 for some time past. Blossburg No. 4 mine is owned by the Raton Coal and Coke Company. It is located in the W. ½ of sec. 28, and E. ½ of sec. 29, T. 31 N., R. 23 E., New Mexico principal base and meridian. It is connected with the main line of the Atchison, Topeka and Santa Fe Railroad by a spur connecting at Dillon station, about 5 miles distant from the mine. The coal seam upon which the mine is located is locally known as the Raton vein, sometimes called the Blossburg vein. The coal is a good quality of bituminus coal, producing a very good coke. The seam, at present faces, is only 4 feet in thicknesss, although the general average throughout the worked-out area has been 7 feet. Dip of vein, 3 degrees. System of working: Slope, double entry, room and pillar. Greatest length of any opening from surface, 9,000 feet. The mine was closed December 1, 1902. The product during the five months of the past fiscal year which it was operated was inconsiderable, and is included with the product of Dutchman mine.

RECORD OF INSPECTION.

October 15, 1902.—Inspected Blossburg No. 4 mine, Raton Coal and Coke Company, operator; J. van Houten, general manager; L. S. Preston, chief engineer; Joseph Curran, superintendent. Air intake, 36,800 cubic feet per minute; 62 men employed underground; air well distributed to working places. Found mine well timbered; no standing gas; ventilation good.

Operation of this mine was abandoned in December, 1902, on account of low coal and faulty ground.

DUTCHMAN MINE.

The Dutchman mine, known in report of last year as Blossburg mine No. 3, is located in sec. 16, T. 31 N., R. 23 E., New Mexico principal base and meridian. It is situated in Dutchman Canyon, about 6 miles, by wagon road, in a northwesterly direction from Raton, N. Mex. It is owned and operated by the Raton Coal and Coke Company; J. van Houten, vice-president; Wm. J. Murray, general manager; Albert Lloyd, superintendent; John Bell, fire boss. A spur of the Atchison, Topeka and Santa Fe Railroad connects the mine with the main line of railroad at Dillon station. Like the other Blossburg mines, it is located upon what is locally known as the Raton vein, by some called the Blossburg vein. The coal is a good grade of bituminous coal, making a good grade of coke. The coal seam is from 6 to 8 feet in thickness; dip of vein about 6 per cent. The mine is worked on the double entry, room-and-pillar system. The entries have been driven to a distance of 3,500 feet from the outcrop. The mine is ventilated by a 24-foot Guibal fan, exhaust, but reversible; capacity, 75,000 cubic feet per minute. The fan is run by electric power, taken off the general electric system, but an independent auxiliary engine is kept in readiness to furnish power for the fan in case of accident to the general electric system. One Jeffrey 550-volt generator, 200 horsepower, and one Card generator, 550-volt, 150 horsepower, furnishes power for haulage, and general use. Tail-rope haulage is being substituted for the motors, and the change will be completed by September 1, 1903.

Two Jeffrey motors, with a capacity of 500 tons per day, are used for haulage from partings in the mine to the tipple.

Average number of men employed outside, 106; average number of boys employed outside, 8; average number of men employed underground, 216; average number of boys employed underground, 12. The men are of various nationalities, predominant in the following order: Italians, Slavonians, French, English, Welsh, and Americans. About 93 per cent of the employees could write, as shown by signatures to receipts and vouchers. The mine was operated about 280 days during the fiscal year. Gross output, 137,838 tons. Amount used in operating mine, 5,792 tons. Net product of mine, 132,046 tons. Estimated value of net product at mine, at $1.15 per ton, $151,852.90. The coal is sold to the Atchison, Topeka and Santa Fe Railroad and at towns along this line of railroad south of Raton.

A strike was inaugurated in October, 1902. It lasted three weeks and lessened the production 10,000 tons. There was no grievance presented to the operators, and the men returned to work on the same basis as before the strike. The employees of this mine are mostly domiciled at the old town of Blossburg, about one-half mile distant from the mine.

The prospects for a big production from this mine in future are very bright. The substitution of tail-rope haulage for electric motors will expedite the transportation of the coal from the partings in the mine to the tipple, as the grade was too heavy for economical operation with motors; the capacity for production will thus be much increased. Nearly every entry in the mine shows 8 feet of coal at the face.

Gas (CH_4) was encountered in considerable volume about January, 1903, and has been a source of solicitude to the operators and the mine inspector. An explosion occurred on the night of June 19, 1903, by which five men were killed, a report of which will be found in the records of inspection hereinafter following. The demand for the coal from this mine was much greater than the supply, the production of the mine being restricted by scarcity of miners and insufficient area of coal developed; development has progressed so that this latter obstacle to production has been removed.

RECORD OF INSPECTION.

October 16, 1902.—Inspected Dutchman mine, heretofore reported as Blossburg No. 3 mine. Found ventilating current strong and air good at working faces; 80 men employed underground. Found mine well timbered; no dust; no standing gas.

Found 4 boys employed underground who appeared to be under 12 years of age. Investigated the matter as much as possible, but both the boys and their parents declared that the boys were 13 and 14 years of age.

February 20, 1903.—Inspected Dutchman mine. Air intake 22,680 cubic feet per minute; 75 men employed underground. Air well distributed to working faces. Found CH_4 venting at faces of entries, along entries, and in rooms, but immediately carried off and diluted beyond danger by air current, which is strong and well distributed. Mine well timbered; no dust.

April 7, 1903.—Inspected Dutchman mine. Air intake 24,300 cubic feet per minute; air well distributed to working faces; 95 men employed underground. Found considerable CH_4 venting into workings and small pots of fire damp in roof of entry and between timbers in roof of entries, and advised that ventilation be increased without delay. Mr. L. S. Preston, chief engineer, informed me that ventilation would be increased as quickly as possible by installing a fan of greater capacity.

May 12, 1903.—Inspected Dutchman mine. Investigated circumstances attending accident whereby Jo Prizer and Harry Musselwhite were injured by explosion of dynamite. Went to location of accident in main entry. Found from evidence of those near by that accident was caused by overheating dynamite while thawing it in a can, and that accident was due to negligence of Jo Prizer, who was injured.

May 13, 1903.—Inspected Dutchman mine. Air intake 20,250 cubic feet per minute; 85 men employed underground. Made tests with safety lamp and found fire damp at roof in several places in entries, but no large body of standing gas. Instructed that ventilation be directed to clearing points where gas was shown. Found several defective safety lamps hanging in lamp cabin near by other lamps that were ready for use. Instructed that only such lamps as are in perfect condition be placed within reach of the miners or at any place where men are liable to get hold of them in an emergency. Found that work upon installation of larger fan was being prosecuted with reasonable diligence. Mine well timbered; no dust.

Sunday, June 21, 1903.—While on official duty at Dawson, N. Mex., I received the following telegram at 11 o'clock a. m., the telegram having been forwarded from Silver City, N. Mex.:

RATON, N. MEX., 6/20, 1903.

Jo E. SHERIDAN,
Mine Inspector, Dawson, N. Mex.:

Gas explosion Blossburg last night, five killed, one seriously injured. Please acknowledge receipt of this message.

RATON COAL AND COKE CO.,
By J. VAN HOUTEN.

I immediately procured a team and drove across the country, as trains are too uncertain. Arrived at Raton, N. Mex., 3.40 p. m. Worked investigating accident until 10.45 p. m.

June 22, 1903.—Inspected Dutchman mine, in which mine explosion occurred, at 10.45 p. m.

MEMORANDUM OF INSPECTION TRIP THROUGH DUTCHMAN MINE NO. 3, BLOSSBURG, COLFAX COUNTY, N. MEX.

Notes of character and degree of violence and course of explosion in Blossburg mine No. 3 on June 19, 1903.

THIRD AND FOURTH ENTRIES.

Found second crosscut east of first south blown toward the south into the third entry. Found first crosscut east of first south undisturbed. Found door on third entry between first and second south blown off its hinges and toward the east.

FIRST AND SECOND SOUTH.

Fall in first south 30 feet south of third entry and one set of timbers blown toward the north. At first crosscut, between first and second south, stoppings were blown east; also one set of timbers in first south blown north at this point.

Heavy fall on first south 30 feet south of first crosscut, and two sets of timbers blown to the north. At second crosscut door was blown west and was found lying on the edge of second south, opposite room 3, in first south on west rib of entry, place where A. Deme was found lying on his face, head to the north and partly buried by fall from the roof. At third crosscut the stoppings had been blown both east and

west, and the rock walls in this crosscut had been thrown out onto the track in both first and second south entries.

Joe Fresnegg and Tom Poyser had been found in first south between fourth and fifth crosscut, both lying face down, head to the north. Also a box containing about 10 pounds of dynamite was still in the entry just south of fourth crosscut and undisturbed.

Toni Novlen had been found in second south at the end of fourth crosscut, lying on his face, head to the north.

At fifth crosscut stopping had been blown east; sixth crosscut same. Seventh crosscut had no stopping, and evidences of a blown-out shot were found in the eighth crosscut, nearly at the face of first and second south entries.

Turning north up second south, at a point between fourth and fifth crosscuts, found powder box blown to the north and turned upside down, with about 5 pounds of dynamite lying on the ground and one box of caps still intact. In second south, just north of second crosscut, one set of timbers had been blown to the north. At first crosscut in second south one set of timbers had been blown north and one set south and fall of rock between. Door between third and fourth entries, on line between second south and first north, had been blown to the north and badly shattered and slivered. Also door on hauling crosscut between third and fourth entries leading to second north had been blown to the south and east, door slivered and splintered, and three or four sets of timbers blown to the south and east.

On fourth entry the stoping between first and second north had been blown to the west. Door in first crosscut between first and second north had been blown to the east and badly splintered.

At pump station in first crosscut, between third and fourth west of second north, the top portion of the stopping had been blown to the north; to the west and north of this no further damage had been done.

Report upon explosion at Blossburg Mine No. 3, Dutchman Canyon, Colfax County, N. Mex.

At 11 a. m., Sunday, June 21, 1903, I received the following telegram, which had been forwarded from Silver City, N. Mex., to me at Dawson, N. Mex.; the Western Union Telegraph Company and Postal-Telegraph Company consuming about twenty-seven hours between sending and delivery of the message:

RATON, N. MEX., 6/20, 1903.

JO E. SHERIDAN,
Mine Inspector, Dawson, N. Mex.:

Gas explosion Blossburg last night, five killed, one seriously injured. Please acknowledge receipt of this message.

RATON COAL AND COKE CO.,
By J. VAN HOUTEN.

I immediately procured a team and drove across the country, a distance of 35 miles from Dawson, N. Mex., to Raton, N. Mex. I did not proceed by the usual route—by stage or buggy to Maxwell City, thence by rail to Raton, N. Mex.—because it would require many hours longer to reach the scene of the explosion, and trains were running so irregularly, on account of washouts, that this means of transportation could not be depended upon.

Arrived at Raton, N. Mex., 3.40 p. m. Upon arrival at Raton, N. Mex., found that funerals of victims of explosion were in progress and that all officials of the company, as well as employees, except guards at the mine, were in attendance at the funeral, and that I could not obtain admission to the mine nor information in regard to the explosion until after funeral. About 5 p. m. I interviewed J. van Houten, general manager of Raton Coal and Coke Company, and obtained considerable information in regard to the explosion.

In the evening Mr. L. S. Preston, chief engineer Raton Coal and Coke Company, explained locality of explosion in the mine by means of map. On Monday morning, June 22, 1903, I went to mine, found guards at entrance, and same conditions maintained in the mine as existed immediately after the explosion, except that some stoppings had been put in crosscuts and doors hung where necessary to restore ventilation to bring out the dead and injured miners.

In company with L. S. Preston, chief engineer; Thomas Thompson, superintendent, and William Floyd, acting fire boss, I went into and examined Blossburg mine No. 3, more particularly the locality in which the explosion had occurred. I took note of the degree of violence exhibited at each point in course of violence as indicated on map and described in memorandum, copies of which accompany this report.

By reference to map and notes it will be observed that the force of explosion originated in the vicinity of the last crosscut between first and second south; that out of six crosscuts in which stoppings had been erected, four of the stoppings were blown east into first north, while in one crosscut, the third, two stoppings of loose-laid stone in either end of crosscut, one had been blown east into first south entry and the other west into second south entry, indicating a local center of violence in this crosscut, probably caused by an accumulation of fire damp from effects of a small gas feeder in the crosscut hitherto undiscovered, this segregation of gas between the walls in the third crosscut being fired by the general explosion, which traversed first and second south entries, threw the stone stoppings to the east and west into both entries named. It will be noticed that nearly all evidences of violence in the first and second south entries show a direction from south to north, as all disturbed articles were moved in that direction.

The greatest degree of violence was shown in the immediate vicinity of the junction of first and second north entries with the main air return. In this vicinity strong doors were shattered and blown to pieces.

In the eighth crosscut, between first and second south entries, a block of coal about 6 feet in thickness was found; this was holed through by a shot which had evidently blown both ways into first and second south entries, and had broken but little coal, but had apparently made a flaming shot blowing into both entries. From this locality it appeared that the force of explosion had come, following the second south entry on the return and contrary to precedent, as explosions in traveling usually seek the intake, or, as the miner expresses it, "an explosion always travels against the air;" which is true, as the explosion seeks the free oxygen necessary to maintain combustion and explosive condition of the gases which constitute the explosion.

Hence it travels toward the free oxygen of the air of the intake rather than toward the return current, polluted with carbonic acid gas, exhalations of men and animals as it comes from the mine on the return.

But in this instance it would appear that the blown-out shot had fired a small stratum of fire damp at the roof of second south entry; that there was not sufficient gas along the roof of this entry to produce a very violent explosion; that the air was equally as fresh in return of second south entry as it was in the intake on first south entry; hence that air was not traveling into first south entry and via crosscut out through second south entry to third and thence to the return. This would indicate an open door through which air was short circuited without going down the entries.

The great probability of this condition is still further supported by the exhibition of great violence at the return airway at junction of all the return entries. The air being short-circuited, the CH_4 from all the entries continued to leak into and accumulate at this point, and when the lesser stratum of fire damp carried the explosion along the second right entry to the said junction of the return airways, then the accumulated gas exploded with greater violence than at any other point in its course.

The force of this explosion blew out all remaining doors in this vicinity and short circuited the air to the return airway, allowing of a continued accumulation of gas, which was again fired by some one within the mine, probably the injured man, Frank Kolisso, seeking his way out, about the time the rescue party was approaching him.

The deceased miners were suffocated by the after damp from the first explosion, together with the gases from what was in all probability an overcharged shot in the crosscut between first and second south.

It is more than probable that the barometer was falling about the time of the explosion, I would believe from what I have learned of the weather conditions shortly after the explosion occurred, heavy clouds obscuring the sky and rain falling within an hour or two thereafter. The falling pressure would allow of greater venting of gas throughout the mine than under ordinary conditions. The leaving of a door open and short circuiting the air just at such a time would result in quicker accumulation of gas than usual. It is evident that there was no great accumulation of gas near the point where the explosion originated, because in this vicinity there was little show of violence, which would necessarily have been shown were any great quantity of gas present and which must have exploded.

It is certain that the first explosion did not originate at the point of greatest violence heretofore mentioned, as there was no means by which the gas could have been ignited at that point.

It is certain that the injured miner, Frank Kolisso, was not at the point where found when the first explosion occurred, for if he were in that immediate vicinity the same violence and concussion which shattered and splintered heavy doors would have produced instant death, in all probability shattering his skull by concussion through the ears, as is common in such instances. He evidently was at his working place in company with his partner, J. Stoln, in return airway; Kolisso ran back

toward the intake and fell where sufficient fresh air reached him to maintain life, while his partner, Stoln, ran along the return airway toward the mouth of the mine, but was overtaken by the air current loaded with after damp and was suffocated.

In my opinion the explosion was due to three untoward and extraordinary conditions in conjunction:

(1) A falling barometer, the lessened atmospheric pressure admitting of the venting of more than the usual quantity of gas, CH_4.

(2) A careless driver or miner leaving a door open, which caused a short circuit of the air.

(3) An overcharged shot, which projected flame and coal dust into the first and second south entries, generating CO from incandescent coal dust, said dust being produced by crushing force of the shot in and around the bore hole; the CO thus generated, together with coal dust in suspension, charging the air of the entry sufficiently, when added to the small amount of CH_4 present, to bring it to the explosive condition.

I would here add that the explosion was one of little violence. From results left it would appear to have been little above the minimum explosive point.

June 28, 1903.—Inspected Dutchman mine. Found new fan in operation and ventilation much improved. Air intake, 37,600 cubic feet per minute; only 10 men underground, working on repairing damage done by explosion June 19 instant. Traversed all points and entries throughout course of explosion, and to faces of first, second, and third south entries, which were pumped out since last visit. Made frequent tests for fire damp. Found all gas venting into entries was immediately dispelled by strong air current. Instructed men in charge to exercise continuous vigilance and caution in regard to ventilation. Advised that Wolf safety lamps be used in all underground operations about the mine.

WILLOW MINE.

[Raton Coal and Coke Company, owners and operators.]

The Willow mine is located in sec. 34, T. 30 N., R. 22 E., New Mexico principal base and meridian. The mine is situated about 14 miles southwest from Raton, Colfax County, N. Mex., and about 9 miles west from Hebron station, on the Atchison, Topeka and Santa Fe Railroad. A branch railroad has been built from the mine to connect with the main line of the Atchison, Topeka and Santa Fe Railroad at Hebron. This branch railroad was completed and operation commenced December 1, 1902, since which date the Willow mine has been one of the largest and steadiest coal producers in New Mexico, as predicted in last annual report. The coal is a good quality of bituminous coal, from which a good quality of coke is made, the slack being hauled by railroad to the washery and coke ovens at Gardiner, N. Mex. The coal seam is from 6 to 11 feet in thickness, the seam lying nearly horizontal. Three openings are being worked, one upon the north side and one upon the south side of Spring Gulch, about one-half mile west of the junction with Willow Creek. Upon the north side of Spring Gulch the coal seam is from 6 to 11 feet in thickness of clean, marketable coal, averaging about 9 feet. On the south side of Spring Gulch the coal seam shows a parting of bone or shale 4 inches in thickness, leaving from 4½ to 5 feet of clean coal both above and below. Another opening is operated upon the same coal seam about three-fourths of a mile south from the openings on Spring Gulch. This opening is situated upon the main fork of Willow Creek. The general characteristics of the coal seam at this point are similar to those described on the south side of Spring Gulch. These three openings are known collectively as the Willow mine. This magnificent coal seam covers a known area of 40 to 60 square miles, through a formation apparently little faulted or disturbed. At many places throughout this area the coal seam is exposed by erosion of canyons and gulches, and at every place where an outcrop is found there is seen the same uniformity as to size of coal seam, and apparently little disturbed bedding plane. Electric power is employed for haulage, running fans, etc. A Card generator is in use, with an efficiency of 375 horsepower, a 550-volt current being transmitted to the various points where used. Exhaust fans are used, but the fans are erected so that the current may be reversed in a very short time in case of necessity. Two motors are in use to haul the coal from the partings in the mine to the tipple, one 10-ton Jeffrey motor and one 15-ton Morgan-Gardner motor. Coal-cutting machines are not in use at present, but the mine is equipped with machines for use when needed. Two steam engines are in use, one of 250 horsepower and one of 170 horsepower. System of working, double entry, room and pillar. Average length of main drift entries, about 2,000 feet. Number of men employed underground, 290; number of boys employed underground,

12; number of men employed outside, 140; number of boys employed outside, 10. The men employed are of various nationalities, as follows: Italians, Slavonians, French, English, Welsh, and Mexicans. As shown by signatures to receipts and vouchers, 95 per cent of them could write. The mine was operated 180 days since December 1, 1902. The gross output of coal was 166,476 tons; amount used at mine, 1 361 tons; net product, 165,115 tons. Estimated value of product at mine, $188,-882.25. The coal is sold to the Atchison, Topeka and Santa Fe Railroad, and marketed in many of the towns along that railroad south of Raton. The improvements during the past year consist of power houses, boarding houses, dwellings, offices, store and other necessary buildings, tipple, tracks, trolley lines, bridges, and all the necessary equipment for the permanent operation of a coal mine with a producing capacity of 2,000 tons per day. The value of such improvements and equipment might be estimated at $250,000. This mine has produced about 1,000 tons per day for each day it was operated, and it may reasonably be expected that this production will be largely increased as greater working area is developed. Production has been restricted to some extent by scarcity of miners, and by the obstacles incident to the opening of a new mine upon a scale of such magnitude. The demand for the product of the mine has been greater than the supply. It may be safely predicted that in future this mine will continue to be one of the largest coal producers in the West.

RECORD OF INSPECTION.

October 13, 1902.—Inspected Willow mines Nos. 1, 2, and 4, situated at Van Houten, about 18 miles south of Raton, N. Mex.; Raton Coal and Coke Company, operator; J. Van Houten, general manager; L. S. Preston, chief engineer. Inspected Willow mine No. 1; air intake, 9,750 cubic feet per minute; 12 men employed underground. Inspected Willow No. 2 mine; air intake, 8,000 cubic feet per miuute; 8 men employed underground. Inspected Willow No. 4 mine; air intake, 5,400 cubic feet per minute; 10 men employed underground. Found mines in good condition; air well distributed; mines well timbered; no gas; ventilation good.

February 19, 1903.—Inspected Willow mines Nos. 1, 2, and 4; Joseph Curran, superintendent. Found ventilating current weak and erratic, but fans being installed at the mines; 200 men employed underground in the three mines. Found some of the rooms carelessly timbered; gave necessary instructions. No gas.

April 8, 1903.—Inspected Willow mine No. 1; Carr Robson, pit boss; air intake, 32,400 cubic feet per minute; 90 men employed underground. Inspected Willow mine No. 2; air intake, 6,000 cubic feet per minute; 58 men employed underground. Scant supply of air, but fan just installed, awaiting erection of fan engine, when ventilation of this mine will be improved. Found both mines in good condition.

April 9, 1903.—Inspected Willow mine No. 4; Jacob Willis, pit boss; air intake, 12,500 cubic feet per minute; 54 men employed underground. Found mine in good condition.

CLIMAX AND SUGARITE MINES.

[Raton Fuel Company, owner and operator; A. L. Hobbs, general manager.]

The Climax mine is located in the SE. ¼ of the SE. ¼ of sec. 23, T. 31 N., R. 23 E., New Mexico principal base and meridian. It is about 1½ miles northwest of the town of Raton, Colfax County, N. Mex. The product is a good grade of bituminous coal; thickness of vein, 4½ feet, nearly horizontal. System of working: Drift, cross entry, room, and pillar. Ventilation by furnace shaft. Length of main-drift entry, 650 feet. Mule haulage. Average number or men employed underground, 3; number of boys employed, 1 outside; nationality of employees, English. Number of days mine was operated during fiscal year ending June 30, 1903, 300. Number of tons of coal mined during fiscal year, 3,771. Estimated value of product at mine, $6,990.40. The coal is hauled in wagons to the town of Raton, where it is sold for domestic use. This mine has but one opening for egress, but the main drift is being steadily driven to reach a second opening which was driven from the opposite side of the hill. About 60 feet yet remains to be driven through to connect the two openings. Value of improvements during fiscal year, $750.

RECORD OF INSPECTION.

October 10, 1902.—Inspected Climax mine; A. Hellas, contractor in charge. Ventilating current weak, erratic, and uncertain, dependent upon atmospheric conditions outside. When main entry is connected with opening in Willoughby Canyon venti-

lation will be improved. Five men employed underground. No gas; mine well timbered.

February 23, 1903.—Inspected Climax mine. Ventilating current weak; 4 men employed underground. Second opening not yet completed; miners have apparently diverged from line given by engineer to open into Willoughby Canyon. New survey will be made this week and correction made in direction of entry. Found mine well timbered; no gas.

April 11, 1903.—Inspected Climax mine. Ventilation weak; second opening not yet completed; 2 men and 1 boy employed. Found few timbers being set by A. Hellas, where he was drawing pillar in third left entry. Warned him to be careful about setting sufficient timbers to give warning of breaking roof.

SUGARITE MINE.

This mine is located on the west side of Sugarite Creek and on the east slope of Bartlett mesa, about 3½ miles in a direct line in a northeasterly direction from Raton, N. Mex. It is a new mine and not identical with the mine heretofore reported as the Sugarite mine. The mine produces a good grade of bituminous coal; thickness of vein, 5 feet, nearly horizontal. System of working: Drift, cross entry, room, and pillar. Length of main drift, 400 feet; average number of men employed underground, 2; number of boys employed, 1 outside; natural ventilation. Number of days mine was operated during fiscal year, about 300; number of tons of coal produced, 2,791; estimated value of output at the mine, $5,163.35. The coal is hauled in wagons to Raton, N. Mex., where it is sold for domestic use.

RECORD OF INSPECTION.

October 9, 1902.—Inspected Sugarite mine; Raton Fuel Company, operator; A. L. Hobbs, general manager; Harry Smith, contractor in charge. Air intake weak and erratic; no register on anemometer; 4 miners and 1 driver employed underground. Found only one opening for ingress or egress from mine. The mine is a new one, but the law is not being obeyed in respect to two openings. Instructed that a second opening be made. I was informed that a second opening, in compliance with law, would be started on Monday next. Found mine well timbered; no gas; ventilation weak.

February 21, 1903.—Inspected Sugarite mine; Harry Smith, contractor in charge. Ventilation weak; instructed that it be improved; 3 men employed underground. Instructed that more diligence be used upon work of making second opening. Found mine well timbered; no gas.

April 13, 1903.—Inspected Sugarite mine; Harry Smith, contractor in charge. Found 2 men employed driving new entry, the only work in operation. But little air traveling in mine, but air good at working face. Instructed that connection be made with old entry to comply with law in regard to second opening.

LLEWELLYN MINE.

[Thomas Llewellyn, owner and operator.]

This mine is located in sec. 18, T. 31 N., R. 25 E., New Mexico principal base and meridian, about 12 miles northeast from the town of Raton, Colfax County, N. Mex. It lies about 200 feet beneath the lava sheet which constitutes the top of Johnson mesa. The coal seam outcrops in the several canyons eroded along the sides of the elevation known as Johnson mesa. The town of Raton is the nearest railroad point. The coal is a good quality of bituminous; thickness of vein, 7½ feet; lies nearly horizontal. System of working: Drift, single entry, room, and pillar; length of main drift entry, 500 feet; system of ventilation, air shaft. Number of men employed underground, 2; 1 boy employed outside; number of days mine worked during fiscal year ending June 30, 1903, 300; number of tons of coal produced during same period, 3,000; estimated value of product at the mine, $3,000. The coal is sold to the farmers upon Johnson mesa and to residents of Folsom and Raton, N. Mex., for domestic purposes.

RECORD OF INSPECTION.

October 14, 1902.—Inspected Llewellyn mine; Thomas Llewellyn, owner and operator. Air good at working faces; 2 men and 1 boy employed. Found opening connecting the mine with the new air shaft to be only 17 inches in height and 15 inches wide, and no ladder way in air shaft, so that it would not serve as a compliance with

the law and requirements of a second opening. Instructed that it be put in proper condition to serve as a second opening, or that a proper second opening be made.

April 10, 1903.—Inspected Llewellyn mine; Thomas Llewellyn, owner and operator. Found operation of the mine temporarily suspended for the day. Found that the owner, Thomas Llewellyn, had neglected to enlarge the opening from mine into air shaft, which constitutes second opening into mine. Measured opening from mine into air shaft; found it to be 17 inches in height and 15 inches wide, rendering it necessary for a person to assume a prostrate position in order to pass through the opening. Instructed Mr. Llewellyn to enlarge said opening, which he promised to do to-morrow. Found the mine otherwise in fair condition.

TURNER MINE.

[John F. Turner, owner and operator.]

The Turner mine is located in E. ½ NE. ¼ and E. ½ SE. ¼ sec. 18, T. 31 N., R. 25 E., New Mexico principal base and meridian, about 12 miles northeast from Raton, Colfax County, N. Mex. Like the Llewellyn mine, it lies about 200 feet beneath the lava sheet. Nearest railroad point is Raton, N. Mex. Thickness of coal vein, 4½ feet; kind of coal, bituminous; system of working, drift, room, and pillar; ventilation by air shaft; length of main drift entry, 500 feet. Number of men employed underground, 2; number of boys employed, 1 outside; number of days mine was operated, 225; number of tons of coal produced, 1,350; estimated value at the mine, $1,350. Product sold for domestic uses at Raton, N. Mex., and to farmers upon Johnson mesa.

RECORD OF INSPECTION.

October 14, 1902.—Inspected Turner mine; John F. Turner, owner and operator. Ventilation weak; no register or anemometer, but air good at working faces; no powder used in mine; 2 men and 1 boy employed. Found no ladder way in air shaft for means of egress from the mine; only one opening fitted for escape in case of emergency. Instructed that ladder way be put in air shaft. Mine otherwise in good condition.

April 10, 1903.—Inspected Turner mine. John F. Turner, owner and operator. Ventilating current erratic and baffling, but air good at working faces; 2 men and 1 boy employed. Found mine in safe condition.

LINCOLN COUNTY.

Lincoln County ranks as third among the coal-producing counties of New Mexico for the fiscal year ending June 30, 1903. The Capitan mines produced 96,000 tons and the Old Abe coal mine, at White Oaks, produced 2,096 tons, or a total of 98,096 tons, a decrease of 23,806 tons from the output of the preceding fiscal year. The decrease is due to faults and rolls encountered in the Capitan mines, but Capitan mine No. 1 is in a good condition for an increased production during the ensuing scal year.

CAPITAN MINES NOS. 1 AND 2.

[New Mexico Fuel Company, owners and operators; W. P. Thompson, general manager; James McCartney, superintendent.]

The Capitan mines are situated at the town of North Capitan, N. Mex., within 1 mile of the terminus of a branch of the El Paso and Northeastern Railroad. This branch road leaves the main line at Carrizozo Station, 143 miles from El Paso, Tex., and 25 miles from the terminus of the branch at Capitan. Capitan mine No. 1 is located in sec. 4, T. 9 S., R. 14 E., New Mexico principal base and meridian. There are 10 seams of coal in these measures, but only 2 of workable thickness. These two veins are known as the Ayers vein and the Akers vein. The former is from 2 to 2½ feet in thickness and the latter from 3½ to 6 feet in thickness. Only the Akers vein is at present operated in mines Nos. 1 and 2. Dip of vein, 12°. System of working, slope, double entry, room and pillar. The No. 1 mine is ventilated by an exhaust fan. A 55-horsepower steam engine provides the power for haulage and a 20-horsepower engine runs the fan. Depth of main slope, 1,000 feet.

Capitan mine No. 2, formerly known as No. 4 mine, is located in NE. ¼ of NE. ¼ and SE. ¼ of NE. ¼ sec. 8, T. 9 S., R. 14 E., New Mexico principal base and meridian. The mine is located upon the same branch of the El Paso and Rock Island Railroad

as described in preceding article upon Lincoln County mines. It is located upon the same coal seam as Capitan mine No. 1, and has a thickness of 3½ to 6 feet of good quality of bituminous coal of a coking variety, similar in this respect to No. 1 mine. The seam dips at an angle of 12° and is worked by slope, cross entry, room, and pillar; depth of slope, 2,000 feet; workings ventilated by exhaust fan. Steam power is used, 125 horsepower being utilized as follows: Haulage engine, 50 horsepower; compressor, 55 horsepower; fan, 20 horsepower. Number of men employed underground in Capitan mines Nos. 1 and 2, 120; number of boys employed underground, 3; number of men employed outside at both mines, 30. Nationality of employees, Italians, Scotch, Irish, Welsh, Mexicans, and Americans. As shown by signatures to vouchers, 90 per cent of the Mexicans could write and 100 per cent of all other nationalities signed the vouchers. Number of days mines were operated, 280; gross output for fiscal year, 96,000 tons; amount used in operating the mines, 1,000 tons; net product of Capitan mines, 95,000 tons; estimated value of product at mines, $190,000,

The coal is marketed in El Paso, Tex. The town of North Capitan—the mines—has a population of about 600, all engaged in mining or business incident thereto. There are about 100 comfortable dwellings, a good schoolhouse, two boarding houses, and a hospital maintained by the company. The location is most healthful, being 6 miles from Fort Stanton, which the United States Government has chosen for a sanitarium for the American merchant-marine sailors on account of its healthy atmosphere and surroundings, especially the very beneficial effects in tubercular disease.

November 10, 1902.—Inspected Capitan mine No. 1. Air intake, 18,270 cubic feet per minute; air well distributed to working faces; 40 men employed underground. Found mine in good condition, no gas, no dust; mine well timbered; ventilation good; machinery and equipment in good condition.

February 7, 1903.—Inspected Capitan mine No. 1. Air intake, 18,500 cubic feet per minute; air well distributed to working faces; 65 men employed underground. Found mine in good condition, no gas, no dust; mine well timbered; ventilation good; machinery and equipment in good condition.

April 27, 1903.—Inspected machinery and equipment of Capitan mine No. 1. Found that cable was considerably worn and called attention of Supt. James McCartney to same, and advised that a new cable be procured before the one in use is worn to the danger point.

April 29, 1903.—Inspected Capitan mine No. 1. Air intake, 16,230 cubic feet per minute; air well distributed to working faces; 60 men employed underground. Found considerable carelessness on part of miners about timbering their working places. Gave necessary instructions. Found mine in good condition, except as mentioned above; no dust, no gas.

May 6, 1903.—Inspected Capitan mine No. 1. Investigated circumstances attending accidental death of James A. Taylor on night of May 1, 1903. From evidence of those in the immediate vicinity when the accident occurred, the accident was due to gross negligence of instructions on the part of deceased. Air intake, 11,500 cubic feet per minute; 50 men underground. Called attention of superintendent to fact that air intake was much less than usual. Air well distributed and good ventilation at working faces. Found trip running without drag; instructed that drag be used.

November 10, 1902.—Inspected Capitan mine No. 2. Air intake, 29,250 cubic feet per minute; air well distributed to working faces; 40 men employed underground. Found that the trip in main slope was being hoisted without a drag; instructed that a drag be placed upon every trip. Found mine in good condition, no gas, no dust; ventilation very good; mine well timbered; machinery and equipment in good condition.

February 7, 1903.—Inspected Capitan mine No. 2. Investigated circumstances attending accidental death of John C. Starling, killed in main slope No. 2 mine on January 29 ultimo. Found from statements of eyewitnesses of accident that the statements of occurrence as given in accident report are correct.

February 9, 1903.—Inspected Capitan mine No. 2. Air intake, 28,000 cubic feet per minute; air well distributed to working faces; 43 men employed underground. Found mine in good condition, no standing gas, no dust; mine well timbered; machinery and equipment in good condition.

April 27, 1903.—Inspected machinery and equipment of Capitan mine No. 2. Found that cable on this mine was also much worn, and advised that new cable be procured before the one in use be worn to the danger point. Found that trip in main slope was being run without a drag, to the risk of anyone in the slope below the trip. Found that drag could not well be used, as the trip frequently stuck at the steepest pitch in main slope and it was necessary to let the trip back because of insufficient steam power. Advised that another boiler be connected, giving greater power, which Supt. James McCartney said would be done next day.

April 28, 1903.—Inspected Capitan mine No. 2. Air intake, 19,800 cubic feet per minute; less volume of air than usual on account of lack of power. Ventilation will be increased when another boiler is connected, which will be done without delay. Air well distributed to working faces; 35 men employed. Found mine in good condition, no gas, no dust; mine well timbered; ventilation good, but weaker than usual.

OLD ABE MINE.

The Old Abe mine is located in the NW. ¼ sec. 5, T. 7 S., R. 13 E., New Mexico principal base and meridian. This mine is owned and operated by the Eagle Mining and Improvement Company, a mining company also operating the Old Abe gold mine, at White Oaks, N. Mex. John M. Rice is general manager of the company and Arnold Ridgeway superintendent of the coal mine. The coal mine is located about 12 miles north from Carrizozo Station, on the El Paso and Rock Island Railroad, and about 3 miles from the town of White Oaks, N. Mex. The mine produces a good grade of bituminous coal. There are two seams of coal upon the property, each 3 feet 6 inches in thickness. Only the No. 1 vein is being operated, No. 2 seam having an opening but 30 feet in depth on dip of vein; only sufficient development on this seam to demonstrate the thickness of seam and quality of coal. On No. 1 vein a slope has been sunk 450 feet, showing an even and continuous coal seam. System of working, combination of long wall with single entry, room and pillar. Natural ventilation through second opening. A common-sense, horsepower whim is used for hoisting the coal from the slope. Number of men employed underground, 4; number of men employed outside, 1. Nationality of employees, Americans and Mexicans; all could read and write. Number of days mine was operated during fiscal year, 186. Production of mine, 2,096½ tons; estimated value of output at mine, at $2.50 per ton, $5,241.25.

The coal is sold at the town of White Oaks, N. Mex., and at the company's quartz mine and mill. The labor is all paid for by the day, no contract work being done. Miners are paid $3 per day and trammers $2.50 per day. The mine has a capacity for production far greater than the present demand, or, more correctly, there is great demand for this grade of coal, but the long haul of 12 miles by wagon to the nearest railroad point at Carrizozo, N. Mex., prohibits the shipment of coal from the mine at a profit, except for use in the immediate vicinity. It is more than probable that transportation facilities, either tram or railroad, will be furnished ere long, and then the White Oaks coal mine will become a producer of considerable importance.

On account of the many more extensive coal mines which it was necessary to inspect this mine was not visited during the past fiscal year.

M'KINLEY COUNTY.

McKinley County, while it far outranks the other counties of New Mexico in extent of area and available tonnage of coal, it takes second place in production during the past fiscal year with a gross production of 540,410 tons, a decrease of 21,026 from the production of the preceding fiscal year. The development upon the mines as well as equipment gives a capacity far exceeding the production during the past year. The reason for decreased production was the lessened demand due to the use of fuel oil on the transcontinental railroads in the Pacific coast States as well as the use of fuel oil for manufacturing and domestic purposes in the same localities, as set forth more fully in preceding pages of this report.

CLARK COAL COMPANY MINE.

This mine is located in NE. ¼ sec. 14, T. 15 N., R. 19 W., New Mexico principal base and meridian. It is owned and operated by the Clark Coal Company, office, 49 Wall street, New York City, N. Y., W. L. Bretherton, agent, Clarkville, N. Mex. A spur of the Santa Fe Pacific Railroad connects the mine with the main line of the railroad and furnishes transportation facilities. The property has an area of 1,200 acres underlaid by five veins of coal of the following thickness, as shown by diamond-drill borings: Top vein, 2½ feet; second vein, 3½ feet; third vein, 3½ feet; fourth vein, 5½ feet, and fifth vein, 4 feet. The coal is a lignite and is used for steam and domestic purposes. Only one vein is worked at present. This vein varies from 4½ to 7½ feet in thickness. Dip of vein varies from 1 to 11 per cent. The system of working is drift, double entry, room, and pillar. Depth of main entry about 3,500 feet from mouth of entry to face.

The mine is ventilated by one Capell fan (exhaust), 11 feet in diameter, located on a shaft about the center of the workings. Electricity is used for haulage, running machines, and other power needed in the operation of the property. Capacity, 700 horsepower; 390 kilowatts, 250 volts, varying amperes as necessary. The electric machinery in use is of various types—Goodman, Morgan-Gardner, Jeffrey, Westinghouse, and Siemens-Halske. Six electric motors, four Goodman and two Jeffrey, aggregating 400 horsepower, are used to bring the coal out of the mine and on to the tipple. The mine is equipped with coal-cutting machinery of 1,000 tons per day capacity. Only one machine is now in use, which has a capacity of 50 tons per day.

Average number of men employed underground, 100; average number of boys employed underground, 3; average number of men employed outside, 36; average number of boys employed outside, 2. The men are of various nationalities, Europeans predominating. The following percentages of the several nationalities show the percentage of employees who could not write, as indicated by signatures to receipts and vouchers: Americans, 20; Irish, 10; Austrians, 10; Italians, 15; French, 20; Mexicans, 20; Navajo Indians, 90. The English, German, Welsh, Scotch, and Danish workmen could all write. As shown by signatures to vouchers, 95 per cent of the men could write. The mine was operated 261 days during the fiscal year. Total output for the fiscal year ending June 30, 1903, 109,000 tons. Number of tons used in operating the mine, 4,000. Net product of mine, 105,000 tons. This shows a decrease in production below the preceding fiscal year of 28,500 tons. Estimated value of output at the mine, $150,000. The coal is marketed in New Mexico, Arizona, California, old Mexico, and Texas, a considerable portion being used at the copper mines of Senator W. A. Clark, at Jerome, Ariz.

The use of fuel oil in the territory where the coal from this mine was marketed it is estimated has lessened the demand 20 per cent. and consequently curtailed the production to that extent. The oils which have been substituted for this coal are produced at Bakersfield, Cal., and Beaumont, Tex. The California oil replaced coal from this mine for railroad purposes in the Pacific States and Territories and the Texas oil replaced the coal in old Mexico, New Mexico, and Texas for railroad, manufacturing, and domestic uses.

During the earlier part of the fiscal year the demand for coal was light, and in the later portion of the year when demand was greater there was a scarcity of miners, which was another factor in restricting the production of the mine.

RECORD OF INSPECTION.

September 27, 1902.—Inspected Clark Coal Company's mine, William McVickers, foreman. Air intake main entry, 19,040 cubic feet per minute; air intake Brown entry, 8,500 cubic feet per minute; total air intake, 27,540 cubic feet per minute; 78 men employed underground. Found air well distributed; mine dusty in some sections; called attention of foreman to this condition. He informed me that there was a scant supply of water, but that danger of a dust explosion was lessened by a strict rule against shooting off the solid, and that all miners were ordered to cut or undermine their coal before shooting, under penalty of discharge for infraction of the rule. Found mine well ventilated, well timbered; no gas.

January 29, 1903.—Inspected Clark Coal Company's mine. Air intake, 20,400 cubic feet per minute; 110 men employed underground; air well distributed. Found strong indications of gob fire between second and third west entries, and found an anomalous condition existing in both entries, at necks of rooms 7 and 8, and between those rooms. Found a peculiar gas coming from the gob through necks of worked-out rooms 7 and 8, heretofore mentioned. The gas has a strong odor resembling illuminating gas, with a slight odor of benzine. Tests made with safety lamps gave peculiar results. The lamps burned with a normal flame and light when carried low near the floor and up to a height of 3½ or 4 feet from the floor, at which height the flame began to grow less, and when raised to the roof of the entry the light was extinguished. The gas encountered was not combustible, nor would it sustain combustion. It was not pure marsh gas, CH_4, because tests made at different points along the entry, where it was partly diffused or mixed with the air, exhibited the same noncombustible property. It does not diffuse readily, but appears to segregate in bunches of a few cubic feet in volume, which small bodies of the gas were encountered at several points before reaching the outlet from which the gas was emitted, the necks of the worked-out rooms 7 and 8. I believe the gas to be N, resulting from the combustion of the gob fire, O being taken from the air to maintain combustion, the gas N, by some unaccountable means, escaping into entries with little mixture of CO or CO_2. Instructed William McVicker, foreman, to exercise caution in regard to this gas reaching the portion of mine in operation; also advised him to take measures to extinguish the fire before it gained headway.

March 7, 1903.—Received telegram forwarded from Silver City, N. Mex., as follows:

GALLUP, N. MEX., *March 4, 1903.*

Mine on fire. Come for consultation.

W. L. BRETHERTON, *Agent.*

As other urgent duties required my presence elsewhere I could not go immediately to Clarkville, but sent letter to Mr. W. L. Bretherton advising him as to my opinion of best methods to pursue.

March 21, 1903.—In company with Mr. W. L. Bretherton, agent, and William McVicker, foreman, I inspected the surface above the burning portion of Clark coal mine. Advised that the several cracks and holes upon the surface, from which gas, steam, and smoke were escaping, be tightly closed by filling and covering such cracks or holes with soil. Also advised that stone or brick stoppings be built into all approaches to the fire underground and as close to the fire as practicable, to exclude all air from the fire. Inspected all entries and approaches to the fire within the mine. Found some CO and CO_2 escaping into mine through stopping in third west entry and considerable of same gases escaping through stopping in fourth west entry. Instructed that double stoppings be built and caution exercised to keep said gases, generated by the gob fire, from escaping into the air traveling toward the operated portion of the mine.

March 24, 1903.—Inspected Clark Coal Company's mine; 94 men employed underground. Found mine dusty in many sections; ventilation good; mine generally well timbered. While I was in the mine Frank Prevedal was seriously injured in No. 3 cross entry from No. 3 entry. Immediately went to place of accident where injured man was lying. Found that a large rock had fallen from roof of entry, breaking his leg in two places, from effects of which injuries he died about twenty-four hours later.

June 17, 1903.—Inspected Clark Coal Company's mine. Total air intake from three intakes, 25,700 cubic feet per minute; 75 men and 3 boys underground; air well distributed. Found mine dusty in several sections and instructed that it be sprinkled. Inspected fire walls built to shut off gob fire heretofore mentioned; found that walls served purpose intended thus far, but instructed that the walls be inspected frequently to guard against danger of cracking or crumbling, and thus allowing gases to escape from fire, and air to reach it. Found mine well ventilated and well timbered; no gas.

RULES AND REGULATIONS OF W. A. CLARK COAL MINES.

1. All miners in the employ of this company must be at their respective places of work at 7.30 a. m., remaining there till 12 m., returning at 1 p. m., and remaining until 5.30 p. m., unless their turns for the day are all loaded.

2. No employee is allowed to leave the mine without the consent of the mine foreman, except in case of sickness or accident. And any miner absenting himself from his work longer than one day, without permission of the mine foreman, shall forfeit all claim to his former place and can only return to work by permission of the mine foreman.

3. All grievances of mine employees must first be submitted to the mine foreman, and in case they can not satisfactorily arrange matters, it shall then be presented to the superintendent of the company, whose decision in all cases must be final.

4. We will not in any way recognize any organization or combination of men who shall in any way combine for the purpose of making demands upon this company.

5. All men in the employ of this company, either by the day or month, are required to be at their respective places of work at 7 a. m., remaining until 12 m., returning to work at 1 p. m., and continuing at their work until 6 p. m., unless excused by the mine foreman. Ten hours shall constitute a day's work.

6. All employees of this company will be subject to the orders of the mine foreman, who has full power to employ and discharge employees of the company, the foreman being at all times subject to the orders of the superintendent.

7. Any employee known to be taking coal from railroad cars will be discharged.

8. No person will be permitted to ride on pit cars while attached to the locomotive.

9. The mine foreman will personally examine the mine and see that all parts thereof are in safe condition. All employees must report any dangerous place to him, who will at once have same repaired and permit no one to enter therein. Reckless or inexperienced persons will not be employed in the mine.

10. Employees passing through doors in any entry or air way and neglecting to close the same will be discharged.

11. Employees taking tools or material of any kind and neglecting to return same

will for the first offense be charged for tools or material so taken, but for the second offense they will be discharged.

12. The abuse of horses, destruction or waste of property belonging to the company will not be permitted.

13. Quarrelsome or intoxicated persons are forbidden to enter the mine or interfere in any manner with those on duty.

14. The company will place an inspector at the tipple, who will inspect each car and deduct all dirt and slate contained therein, such an amount per car as his judgment may direct. He shall report the fact of such deductions having been made to the superintendent or mine foreman, who shall personally examine into the matter, and unless a good and sufficient reason is shown by the miner why such was loaded he shall be discharged.

15. Cars may be weighed while in motion, passing over the scales, but if so weighed must pass sufficiently slow as to admit of correct weight being taken by weigh boss.

16. Persons or families of persons not in the employ of the company will in no case be permitted to occupy company buildings.

17. Any employee discharged from the works will be required to leave his place in good condition, to deliver any company property in his possession to the mine foreman. Any employee neglecting or refusing to keep his place in good and safe condition will be discharged, and the cost of putting his place in proper shape deducted from any balance due.

18. Every person who shall be in the employ of the company for as much as two days shall be assessed $1.50 for a doctor and hospital fee, and thereafter each assessment of $1.50 shall be made monthly as long as such person is in the employ of the company. Such assessments shall be paid for the services of a doctor and hospital selected by the company.

19. Miners will be expected to keep their places well timbered and in a safe condition, and the mine foreman will see that timbers for this purpose are constantly kept on hand, one end of such timbers cut square for such purpose.

20. Miners are under the direction of the mine foreman while underground, and such mine foreman shall direct the manner of putting in minings and shots, shall order timbers set up, or break-throughs or crosscuts made where, in his judgment, such are needed, and no timbers, break-throughs, or crosscuts unless so ordered will be paid for by the company.

21. No person except those employed therein will be permitted to enter the weigh office or speak to the weigh boss while on duty.

22. All employees are subject to a monthly tax for water and school expenses.

23. Single men occupying rooms, cottages, and houses will rent at a price to be agreed upon. A charge of $2 a ton will be made for coal delivered to employees living at the mines.

24. This company compels no man to enter its employ or service, and will insist on its right to discharge any or all employees at any time without explanation. The superintendent will rigidly enforce these rules and discharge any employee violating them.

25. Notices signed by the superintendent not in conflict with these rules and regulations will be binding on employees and must be obeyed by them.

These rules and regulations are in full force and effect from this date, and anyone who is not willing to work under them and abide by them can not enter the employ of this company.

MINER'S ANNUAL CONTRACT, CLARKVILLE, N. MEX.

This agreement, made this —— day of ———, A. D. 1—, between W. L. Bretherton, agent, of the first part, and ——— ——— of the second part,

Witnesseth, that the said party of the second part has agreed, and by these presents does hereby agree, to enter the employment of said party of the first part as a ———, to commence on the —— day of ———, A. D. 1—, and to abide by and to adhere to and observe the rules and regulations set out and printed on the back hereof, numbered 1 to 25, inclusive, and which are hereby made a part of this contract to the like extent as if herein written, and in addition to abide by and observe all other rules and regulations as may be adopted from time to time by said coal company, party of the first part, by and with the consent of the party of the second part, for the purpose of regulation of mining and other employment in and about the coal mines and property of the said coal company, party of the first part.

The said party of the second part further agrees to keep his room or working place in good order and repair, well secured and propped; and also that if the said party of the second part shall at any time deem his room unsafe and insecure by reason of a neglect or failure to deliver props, he shall at once cease work in said room or work-

ing place, and shall not resume work therein until first suitable props have been delivered and he has made his room secure; and also that he will not be absent from his employment hereunder without leave, except in case of sickness or other unavoidable contingency that will prevent him from work.

The party of the first part agrees to furnish at the mouth of the room requisite material—rails, props, and supplies—to keep said room in good working order after party of the second part has made requisition to driver for same.

The party of the first part agrees to pay the said party of the second part for each ton of coal mined by him and delivered on pit cars as follows, less all deductions, set-offs, and counterclaims due at date of payment: —— cents per ton of 2,000 pounds, unscreened coal, from ———, 1—, to ———, 1—, all coal to be free from rock, bony, or other avoidable impurities.

The party of the first part agrees to pay the party of the second part ——— dollars for each day, month, the party of the second part may be employed on company work by the party of the first part, less all deductions, set-offs, and counterclaims due at date of payment.

Said first party hereby reserves the right and privilege of closing its mines at any time or of reducing the number of employees by discharge of all or such of them, including said second party, as the superintendent or the person having charge of the mines for the time being may think proper. All payments hereunder to be made on regular pay day and in compliance with the rules and regulations above named, and pay day is hereby fixed for and on the Saturday nearest the 25th day of each month, when and at which time all wages or moneys that may have been earned during and in the calendar month next prior to such pay day shall be paid, less all moneys owing said party of the first part on any account whatever up to date.

It is hereby expressly agreed and understood by the party of the second part that should he become a tenant of the party of the first part during the term of his engagement, then in case of the termination of this contract, either by his discharge from the employ of the said first party, or in any other way, the term of such tenancy shall at once cease and be determined without notice, and he will vacate the premises occupied by him, upon verbal notice of the agent or superintendent of the said first party, written notice to quit being hereby expressly waived, and on failure so to do will be deemed guilty of forcible detainer of such premises, and that he will not be entitled to demand or receive any part of the wages due him for labor performed (should the party of the first part so elect) until such premises are vacated and the keys thereof delivered at the office of said first party.

And the party of the second part further agrees that he will not stop work, leave the employment of said party of the first part, or join or become a party to, either directly or indirectly, any strike or combination for the purpose of obtaining, or the intent of which is to obtain from, or cause the company, party of the first part, to pay their miners or other employees an advance of wages or pay beyond what is specified in this or their contract, nor for any other cause whatever. Nor will he in any manner aid, abet, or countenance any such strike, combination, or scheme whatever during the time specified in the first clause of this contract. And if the said party of the second part at any time shall violate any of the provisions of this contract in this regard he shall thereby forfeit all claim for coal, prior thereto, mined or labor performed and not paid for, and the said first party shall be fully released from all liabilities on account of this contract for coal mined or labor performed by the said party of the second part.

For and in consideration of the foregoing agreements, the company, party of the first part, hereby covenants and agrees that it will not join any combination with other companies, or be a party, either directly or indirectly, for the purpose of reducing the rate of wages of the party of the second part below the sum specified in this contract. Nor will it in any manner aid, abet, or countenance any combination or scheme whatever, that has for its purpose any such object or design during the time specified in the first clause of this contract. And if the said party of the first part shall violate any of the provisions of this contract in this regard it will thereby forfeit a sum of money not to exceed fifty ($50) dollars as a penalty to the said party of the second part. Party of the second part also agrees to accept said sum (of $50) in full for any damage he may sustain by any violation of the provisions of this clause of this contract, and on receipt of same waives all further claims for damages against said party of the first part.

In witness whereof the said parties have hereunto set their hands and seals this day and year first above mentioned.

W. L. BRETHERTON, *Agent.*

——— ———, *Witness.*

Signed in duplicate.

(Read the rules and regulations.)

WEAVER MINE.

The Weaver mine is located in the SE. ¼ of sec. 34, T. 16 N., R. 18 W., New Mexico principal base and meridian. The mine is owned and operated by the American Fuel Company, John T. Kebler, general manager, address, Boston Building, Denver, Colo.; Thomas Pattison, division superintendent, Gallup, N. Mex.; Hugh McGinn, pit boss, Gibson, N. Mex. The mine is connected with the main line of the Santa Fe Pacific Railroad at Gallup, N. Mex., by a branch road 3½ miles in length, which furnishes transportation facilities. There are six veins of coal in this property, identical with those hereinafter described in the Gallup mine. Two veins are being worked in the Weaver mine, known as No. 3 and No. 3½. Thickness of coal seams: No. 3 vein, 5 feet; No. 3½ vein, 5 to 7 feet. Both seams have sandstone roof and floor, in general, throughout the mine. The mine is opened by drift into the veins, then by double entry, rib, and room system. The mine is ventilated by a propulsion fan, reversible. The mine mouth is located 800 feet from the tipple, on an elevation of 6 inches in 100 feet, so that mules easily haul the loaded trips to the tipple, and have but a slight grade to overcome returning with the empty trip. A 30-horsepower steam engine runs the fan, and an 80-horsepower engine the shaking screen and slack blower. Length of drift, 3,500 feet. Dip of vein, 3½ per cent; worked against the pitch. The mine is equipped with the most improved appliances for economical operation—tipple, chutes, shaking screens and slack blower, machine shop, carpenter and blacksmith shops. Dwellings have been erected for the use of employees. A well 1,000 feet in depth furnishes an ample supply of water for the camp and mine; bath houses, with accommodations for 150 men; new stables, grain storehouse, powder magazine, and oil rooms. Average number of men employed underground, 260; average number of boys employed underground, 10; average number of men employed outside, 98; average number of boys employed outside, 10. The employees are of various nationalities and races—Americans, Hungarians, English, Irish, Scotch, Germans, Italians, Slavs, Swedes, Mexicans, and Japanese. As shown by signatures to vouchers, the following percentages of the different nationalities could not write: Mexicans, 10 per cent; Italians and Slavs, 8 per cent; Hungarians, 5 per cent; Germans, 4 per cent; Americans, English, Irish, and Scotch, 1 per cent.

The mine was operated 300 days during the fiscal year; the gross product of coal was 376,707½ tons; used in operating mine, 4,680 tons; net output, 372,027½ tons; estimated value at the mine at an average price per ton of $1.20+, $447,106.87. The coal is sold in California, Arizona, and New Mexico, a large portion of it being used by the Santa Fe Pacific Railroad. Improvements and addition to equipment: New tracks, $5,000; 100 new pit cars, $5,000; mules, $7,000; total, $17,000.

The Weaver mine is a record breaker among New Mexico's coal-producing mines, the number of tons produced during the past fiscal year being the largest tonnage ever taken out of any coal mine in New Mexico, and all being brought out through one single main-drift entry with only one outlet for coal.

The camp is provided with all conveniences possible, and more than usually found in coal camps. Convenient hydrants supply water to all the dwelling houses; each house being supplied with covered garbage receptacles, which are emptied every day by a camp scavenger, with horse and wagon, employed by the company for the purpose. Every effort is made for the comfort and sanitary welfare of the employees.

RECORD OF INSPECTION.

September 23, 1902.—Investigated circumstances attending accidental death of Francisco Rosales, who was killed in the main entry of the Weaver mine on September 8, 1902. Heard the testimony of men who saw the accident occur, and find that the description of same given in the accident report is a true statement of the facts.

September 25, 1902.—Inspected Weaver mine. Air intake 34,100 cubic feet per minute. Inspected 3½ vein. Found this portion of mine in good condition. Mine well timbered, sprinkled to allay dust, no gas, ventilation good; 212 men employed underground.

September 26, 1902.—Completed inspection of Weaver mine. Inspected No. 3 vein. Found mine in good condition, well timbered, sprinkled to allay dust, no gas, ventilation good.

November 21 and 22, 1902.—Inspected Weaver mine. Air intake 42,840 cubic feet per minute; air well distributed to working faces; 260 men employed underground. Found mine in good condition, no gas, mine well sprinkled to allay dust, well timbered, ventilation good.

January 28, 1903.—Inspected Weaver mine. Air intake 45,000 cubic feet per minute; air well distributed to working faces; 250 men employed underground. Found mine in good condition, well timbered, no gas, well sprinkled to allay dust, ventilation good. Investigated circumstances attending injury of George Andler on January 2, 1903, from the effects of which injuries he died on January 7, 1903. From evidence adduced, I found that the statement of the case in the accident report made to me by the mine superintendent is correct and true.

March 19, 1903.—Inspected machinery, cars, etc., in use upon Weaver mine; found same in good condition. Made inquiry and investigated circumstances attending accidental death of Charles Karrow, who was killed in room 31 off first L air course; body found January 30, 1903. Found circumstances to have been as related in accident report.

March 20, 1903.—Inspected Weaver mine. Air intake 35,625 cubic feet per minute, air well distributed to working faces; 230 men employed underground. Found mine in good condition, well timbered, sprinkled to allay dust, no gas, ventilation good.

March 23, 1903.—Inspected Weaver mine; 230 men employed underground. Found mine in good condition, no gas, mine well timbered, sprinkled to allay dust, ventilation good.

June 13, 1903.—Inspected Weaver mine; 230 men employed underground. Found mine more dusty than usual and air not as well distributed as usual; gave instructions that these defects be remedied.

June 15, 1903.—Completed inspection of Weaver mine. Found that instructions had been followed and mine sprinkled to allay dust. Found mine in good condition, well timbered, no gas, ventilation good.

GALLUP MINE.

The Gallup mine is situated at the village of Gibson, McKinley County, N. Mex. The mine lies in secs. 33 and 34, T. 16 N., R. 18 W., New Mexico principal base and meridian. The mine is owned and operated by the American Fuel Company, John T. Kebler, general manager; address, Boston Building, Denver, Colo.; Thomas Pattison, division superintendent, Gallup, N. Mex.; Hugh McGinn, mine superintendent, Gibson, N. Mex.

The mine is connected with the main line of the Santa Fe Pacific Railroad by a branch road 3½ miles in length which furnishes transportation facilities for the product. There are six coal seams of workable thickness and extent in this property, with an average cover of 200 feet on top vein. The seams are all exposed by outcrop, which shows the distance between the seams to be very irregular—from 7 to 30 feet apart. The thickness of these coal beds is as follows: No. 1, 6 feet; No. 2, 5 feet; No. 3, 5 feet; No. 3½, 5 feet; No. 4, 4 feet; No. 5, 6 feet. Three of these veins—No. 3, No. 3½, and No. 5—are worked in the Gallup mine. The mine is operated by slope, double entry, room, and pillar system. Ventilation is by propulsion fan. Steam power is used in operating the mine—five engines of 100, 50, 100, 30, and 35 horsepower; total, 315 horsepower. This mine has precedence for the deepest slope in New Mexico—about 5,000 feet. Dip of coal seams from 5° to 14°; average, 10°. Operation of the mine was suspended on March 31, 1902, owing to the increased production from the Weaver mine adjoining, and which is owned and operated by the same company. The increased production of the Weaver mine was sufficient to supply the demand. While this is the ostensible cause of the suspension of operation of the Gallup mine, and of the Catalpa mine also, yet there is still another reason why the demand was not sufficient to keep all three mines—Gallup, Catalpa, and Weaver—besides all of the other mines of this district working to their full capacity. The true reason for restricted operation and production from the mines of this county was that the demand was curtailed by the substitution of oil for fuel in the principal markets for these mines, which have been in California and upon the railroads running into and through that State. But this subject has been exploited more fully in the earlier pages of this report. This mine has now resumed operation (since June 30, 1903), and will hereafter be one of the largest producers in the Territory. Many important improvements were made during the past year. A haulage engine, equal in capacity to any haulage engine in use in any of the collieries of the United States, has been installed. The engine was manufactured by the Sullivan Machinery Company of Chicago. It is a double engine, 22-inch cylinders, 36-inch stroke; crank shaft, 8½ inches in diameter; drum shaft, 11 inches in diameter; two drums, each 8 feet in diameter by 5 feet in width. Each drum has two brake bands 10 feet 6 inches in diameter by 12 inches wide. There are dial indicators attached to each drum that the engineer may know the exact location of the trip at any time in its ascent

or descent. The engineer stands upon an elevated platform with the indicators and every other part of the engine and hoist in full view. The reverse lever and band frictions are controlled by steam cylinders. The brakes are operated by two steam cylinders, with a screw hand brake in reserve in case of accident or emergency. In operating the engine the engineer has in reserve the friction clutch which can be used if the hand and steam brakes should either, or both, fail. All these safeguards are within easy reach of the engineer upon his platform. The two engines are capable of transmitting 800 horsepower and are geared 3 to 1, which gives an efficiency of 2,400 horsepower on the drum shaft. The steam will be furnished by a battery of four 100 horsepower high pressure boilers, 150 pounds working pressure. The steaming capacity will be increased by addition of two similar boilers, making 600 horsepower, as requirements of the mine demand increased power. The main haulage rope will be 1½ inch steel wire round cable. The plant is calculated to haul 35 cars on each trip from the bottom of the 5,000-foot slope, angle of pitch at bottom of slope 22°, lessening gradually to 5° at mouth of slope. It is expected to run six trips per hour, and as each of the 35 cars will contain 1½ tons of coal, 315 tons per hour will be hoisted from the mine when the plant is running to its full capacity.

A tail rope runs from the mouth of the slope 350 feet to the knuckle, traveling around a 6 foot shieve wheel, the loaded cars, traveling by force of gravity from the mouth of the slope to the tipple, bringing up the empty cars from the tipple to the mouth of the slope.

The tipple is a Wilson patent coal and ore dump No. 285, manufactured by the Sullivan Machinery Company, Chicago, Ill. On the tipple is a Fairbanks scale, 40,000 pounds capacity, for weighing mine cars. The scale is a special make, made to withstand the concussion and jar incident to the bumping of loaded mine cars as they are weighed. The tipple proper, aside from the dumping apparatus, consists of the lump coal screen, bars 2½ by 1½ inches, 4 inches apart; engine-coal screen, a diamond bar screen with 1½-inch openings. After passing through the engine-coal screen the coal is elevated to a perforated plate iron, revolving screen driven by friction rollers. The revolving screen is 20 feet long by 6 feet in diameter, it has no shaft nor spider inside against which the coal can strike and be broken still smaller, but is a smooth perforated iron cylinder along which the coal travels without violent motion until dropped out. The first 10 feet of the revolving screen has ⅜ inch round perforations through which the slack is dropped; the next 10 feet of the screen has ¾ inch round holes venting the pea coal below, and what travels on through the cylindrical screen is classed as nut coal. On a floor below a drag conveyor delivers the nut and pea coal to a car or other receptacle in which it is desired to place it. The slack can be delivered into a car or into the slack blower as wanted. All stray droppings of coal about the tipple are caught in a hopper under the tipple and thence delivered into cars.

The dust-collector system for the tipple is a novel feature, this as well as severa new labor-saving and economical devices about the tipple are due to the ingenuity of Mr. C. H. Stevenson, master mechanic for the company.

The dust collector consists of a Buffalo No. 9 B volume blower, manufactured by the Buffalo Forge Company, which collects all dust by suction from the chutes, elevator, and revolving screen. The dust is precipitated by centrifugal action of the air throwing the dust against the sides of the hopper of the dust collector, whence it may be dropped to the slack blower or to other means of removal from the premises. The object of the dust collector is for the removal of the fine coal dust which would otherwise lodge upon the timbers and in cracks and crevices about the tipple. This dust is highly inflammable and would be easily ignited by a spark from the railroad locomotive when cars are being shunted in on the tracks.

The aprons, or chutes for conveying the ore into the railroad cars, are adjustable to any height of car and can be drawn back into the recess between the timbers out of danger of being struck by the railroad cars as the car is dropped down under the chutes. By another ingenious device the man who has charge of the chutes on the tipple can also control the railroad cars to be loaded on the tracks above the tipple, allowing them to drop down to the chutes as needed. By reason of the adjustable aprons and other devices, railroad cars can be changed without stopping the tipple. As it requires an average of nine minutes to load a railroad car and one minute to replace the loaded car with an empty car ready for loading, it can be seen that 10 per cent of the efficiency of the ordinary tipple is lost. Where sixty cars of 30 to 40 tons capacity are loaded this is a matter of considerable importance. The working capacity of the tipple is 250 tons per hour, or 2,500 tons per working day of 10 hours. It is expected this can be slightly increased when necessary. There are four railroad loading tracks and one passing track; four cars can be loaded at one time, or all the coal can be dumped into one car.

The engine to run the tipple and machinery incident thereto is a 30-horsepower, Fairbanks Morse, slide-valve engine. It only requires 17 horsepower to operate the tipple and machinery, but the advantage gained in short cut-off on steam makes the larger engine more econominal than one of scant power. The slack blower is driven by a wire-rope pulley—all other pulleys are Jeffrey link belt—sprockets and bolt. The dimensions of the tipple are as follows: Total length of tipple, 410 feet; trestlework approach to tipple, 168 feet long, 12 feet to 22 feet wide; length of loaded track, 328 feet; width, 12 feet; length of empty track, 325 feet; width, 10 feet. Loaded or empty tracks hold 35 to 38 mine cars, number dependent on style of coupling. Height of loaded track on tipple, above railroad-track rail below, 28 feet. Tipple planked with 3-inch plank, all planking bolted instead of spiked to timbers. Grade on approach to tipple 6.5 per cent to 5.7 per cent, easing down to 1½ at loaded track on tipple. Grade of loaded track 1.25 per cent; grade of empty track 1.5 per cent.

The new haulage equipment and tipple of the Gallup mine at Gibson, N. Mex., is up to date in every modern improvement and labor-saving device, besides having several economical improvements not found in any other mine. As a whole it is equal to anything of the kind in the United States, and is superior to similar equipment of most of the large coal mines in the East and South.

CATALPA MINE.

The Catalpa mine is located in NE. ¼ of sec. 34, T. 15 N., R. 18 W., New Mexico principal base and meridian. It is owned and operated by the American Fuel Company, and under the same management as the Gallup and Weaver mines. The mine lies about 5 miles south of the town of Gallup, and is connected with the main line of the Santa Fe Pacific Railroad by a branch road 5 miles in length. There are four known seams of coal in the measures at this mine which average 5 feet in thickness. Two of these seams, known locally as the Crown Point and Thatcher veins, are worked through the Catalpa mine, the thickness of the coal in these seams being about 5 and 6 feet, respectively. Kind of coal, lignite; dip of vein, 8°; depth of slope 2,400 feet. System of working, slope from outcrop, double entry, room, and pillar. Ventilation by exhaust fan. Steam power is used for haulage and other purposes. Four engines, 125, 100, 30, and 35 horsepower, are used for haulage, operating tipple, screens, fan, etc. On February 14, 1902, operation of this mine was temporarily suspended because of the increased production of the Weaver mine being sufficient to supply all demands. In other words, the substitution of oil for coal as a fuel in California and on the western divisions of the transcontinental railroads has lessened the demand from that direction upon the Gallup coal fields.

OTERO MINE.

The Otero mine is located in the NE. ¼ of the NW. ¼ of sec. 14, T. 15 N., R. 18 W., New Mexico principal base and meridian. It lies about 3 miles east and 1 mile north of the town of Gallup, N. Mex. It is owned and operated by the Caledonian Coal Company, of Gallup, N. Mex., Alexander Bowie, general manager; John Stewart, superintendent. A spur connects the mine with the main line of the Santa Fe Pacific Railroad.

Four seams of workable thickness are known in the property, viz, Crown Point, Thatcher, Black Diamond, and Otero. Three of these veins are worked through the Otero mine, viz, Crown Point, 4½ feet in thickness; Thatcher, 4½ feet in thickness, and Otero, 5 feet thick.

The system of working is by slope, double entry, room, and pillar. The mine is ventilated by a Crawford & McCrimmon 12-foot fan. Six steam engines are in use at the mine, viz, hoisting engine, 50 horsepower; blower, 25 horsepower; fan, 16 horsepower; 2 pump engines, 10 horsepower each, and 1 of 12 horsepower. Depth of slope, 1,400 feet; dip of vein, 2 to 8 per cent. Kind of coal, lignite. Thickness of vein, 5 feet. Average number of men employed underground, 35; average number of men employed outside, 8. Nationality of employees not obtained. Number of days the mine was operated during fiscal year, 215; total output for fiscal year, 25,053 tons; amount used in operating mine, 1,900 tons; net product, 23,153 tons; estimated value at the mine, $34,729.

The coal is marketed principally in California and Mexico, being shipped over the Atchison, Topeka and Santa Fe Railroad, Cananea, Yaqui River and Pacific Railroad, and El Paso and Southwestern Railroad.

The output of this mine was very much restricted by reason of excess of supply over demand, partly attributable to substitution of oil for fuel in the localities heretofore dependent upon these coal fields for fuel supply.

RECORD OF INSPECTION.

June 16, 1903.—Inspected Otero mine, workings on Crown Point vein. Air intake 4,680 cubic feet per minute; 11 men underground; air good at working faces. Found this portion of the mine dusty, and called attention of John Stewart, superintendent, to same, with instructions that this condition be remedied. Inspected workings on Otero vein, Otero mine; air intake 3,750 cubic feet per minute; 10 men underground. Found this portion of the mine dusty, and notified Superintendent Stewart that condition should be remedied. Inspected Thatcher vein on Otero mine; air intake 7,600 cubic feet per minute; 22 men underground. Found this portion of mine in good condition, no dust, ventilation fair. Found no gas in any portion of Otero mine.

THATCHER MINE.

The Thatcher mine is located in the SW. ¼ of sec. 12, T. 15 N., R. 18 W., New Mexico principal base and meridian. This mine is situated about 3 miles, in an easterly direction, from the town of Gallup, McKinley County, N. Mex. The mine is owned and operated by the Caledonian Coal Company, of Gallup, N. Mex., Alexander Bowie, general manager.

A spur connects the mine with the main line of the Santa Fe Pacific Railroad. Two coal seams are worked in the Thatcher mine, one known as the Thatcher and the other as the Black Diamond. Average thickness of each coal seam, 4 feet 6 inches. System of working, slope, double entry, room, and pillar. Ventilation by exhaust fan. Six steam engines are in use, viz, hoisting engine, 160 horsepower; blower, 60 horsepower; fan, 16 horsepower; shaker, 16 horsepower, and 2 pumping engines of 10 and 12 horsepower. Dip of coal seams about 8°; depth of slope, 1,800 feet. Operation of this mine was suspended during the past fiscal year because there was no demand for the product. Lack of demand attributable to same causes hereinbefore mentioned in regard to same matters on Catalpa and other mines.

UNION MINE.

The Union mine is located in N. ½ of NE. ¼ of sec. 28, T. 15, R. 18 W., New Mexico principal base and meridian. It lies about 2 miles south of the town of Gallup, McKinley County, N. Mex. It is owned and operated by the Union Coal Company, John C. Spears, president; William McVickers, general manager. The members composing the company are J. C. Spears, William McVicker, H. Brown, T. A. Fabro, D. Clark, and William Kilpatrick.

Three seams of workable thickness are known to exist in the company's ground. The seams are known as the Aztec, Black Diamond, and Thatcher veins. The depths of these seams from the surface at which these coal seams occur are, respectively, as follows: 35 feet, 320 feet, and 360 feet. These seams outcrop in the canyon half a mile distant from the Union mine. The thickness of the beds are as follows: Aztec, 5 feet 4 inches; Black Diamond, 6 feet 6 inches, and Thatcher, 5 feet 8 inches. The Union company is operating upon the Black Diamond seam.

The mine is opened by slope, double entry, room, and pillar system; ventilated by furnace; depth of slope, 700 feet; dip of coal seam, 17°. A 20-horsepower steam engine supplies the power for haulage from mine to tipple. The hoisting plant upon this mine was burned twice during the years 1901 and 1902 and was not replaced when burned the last time. Operation has been suspended for the past year.

CASNA MINE.

The Casna mine is located in SW. ¼ of sec. 18, T. 15 N., R. 18 E., New Mexico principal base and meridian. It lies about 2 miles west of the town of Gallup, McKinley County, N. Mex. It is owned and operated by Andrea Casna.

Kind of coal, lignite; one vein worked; thickness of coal seam, 4 feet; system of working, slope, room, and pillar; ventilation by two air shafts; dip of coal seam, 2 per cent; length of slope, 1,100 feet; mule haulage. Average number of men employed underground, 2; average number of men employed outside, 1. The men employed at this time are Italians and can read and write. Number of days mine was operated during fiscal year ending June 30, 1903, 90; total output of mine for fiscal year, 50 tons; estimated value of product at mine, $300.

BLACK DIAMOND MINE.

The Black Diamond mine, formerly known as the Stewart mine, is located in the SE. ¼ of sec. 9, T. 15 N., R. 18 W., New Mexico principal base and meridian. It is

located about 1½ miles from the Santa Fe Pacific Railroad station at Gallup, N. Mex., to which point the coal is hauled in wagons for shipment by rail. The property is owned by the Black Diamond Coal Company, John Sharp, superintendent. The property was opened by William Stewart about a year and a half ago. The mine is supposed to be on the Black Diamond coal seam; the coal is bituminous; thickness of seam, 6 feet; dip of seam about 18°; system of working, slope, single entry, room, and pillar; depth of slope about 500 feet; natural ventilation by air shaft; steam hoist. Average number of men employed underground, 10; average number of men employed outside, 2; number of days mine was operated during fiscal year, about 180. Estimated net product, 5,000 tons; value at mine, $7,000. The coal is marketed in Arizona, California, and New Mexico, and is shipped via the Santa Fe route.

RECORD OF INSPECTION.

March 26, 1903.—Inspected Black Diamond mine. Air intake, 5,280 cubic feet per minute; 10 men employed underground. Found that there was no ladder way in air shaft to make it available as a lawful second opening. Instructed that a ladder way be put in air shaft if it were to be considered as the second opening. Found mine in good condition; no gas; mine well timbered.

ROCKY CLIFF MINE.

The Rocky Cliff mine is located in the SE. ¼ of SE. ¼ of sec. 10, T. 15 N., R. 18 W., New Mexico principal base and meridian. It is situated about 2 miles northeast from the town of Gallup, N. Mex. The mine is owned and operated by Stephen Canavan; address, Gallup, N. Mex.; J. R. Brown, superintendent.

A spur connects the mine with the main line of the Santa Fe Pacific Railroad. Thickness of coal seam, 5 feet; dip, about 3 per cent; system of working, slope, single entry, room, and pillar; depth of slope, 1,200 feet; ventilation by furnace shaft. Mule haulage to tipple. Average number of men employed underground, 30; average number of men employed outside, 2. Nationality of employees, principally Europeans. Percentage who could not write, as shown by signatures to vouchers, 1 per cent.

Number of days mine was operated during fiscal year, 280; total output, 24,000 tons; estimated value of output at mine, $32,400. The coal is marketed in Arizona, California, and New Mexico, and is shipped via the Atchison, Topeka and Santa Fe Railroad. The same causes which restricted production in other mines of this field also restricted production at this mine, viz, substitution of fuel oil, as also scarcity of miners during the season when demand was greatest.

RECORD OF INSPECTION.

March 25, 1903.—Inspected Rocky Cliff mine. Air intake, 6,600 cubic feet per minute; 25 men employed underground; air well distributed. Found several rooms in which miners were taking reckless chances of being hurt by working under loose, overhanging rock and top coal. Gave necessary instructions. No gas; mine dry in places; generally well timbered.

RIO ARRIBA COUNTY.

Rio Arriba County ranks fifth among the coal-producing counties of New Mexico, the production for the past fiscal year amounting to 39,100 tons, a decrease from the production of the preceding year of 11,500 tons. Strikes retarded the production to a small extent, but scarcity of miners was the principal factor in limiting the production of coal in Rio Arriba County. While it is not probable the Rio Arriba will ever be a close competitor for first place among the coal-producing counties of the Territory, yet it is certain, from the favorable location of its mines and the territory dependent upon them for the nearest accessible fuel supply, that the production of Rio Arriba County mines will be greatly increased in the near future, and also that new mines will be opened to supply the increased demand, which is now easy to foresee.

MONERO MINE.

The Monero mine is located in the NE. ¼ of sec. 18, T. 31 N., R. 1 E., New Mexico principal base and meridian. The mine is located at Monero station, on the Durango branch of the Denver and Rio Grande Railroad and between Durango and Antonito,

Colo., but south of the State line and in the Territory of New Mexico. The mine is owned and operated by the Rio Arriba Coal Company, J. H. Crist, general manager; address, Monero, Rio Arriba County, N. Mex.

The coal is an extra good quality of bituminous coal, an especially good coal for both steam and domestic use. There are three workable veins in this coal field of the following thicknesses, respectively; 4 feet, 3 feet 4 inches, and 3 feet. The Monero mine is opened by slope, cross entries, and rooms. A slope has been driven 1,600 feet in depth upon the 4-foot seam, and another slope 600 feet in depth upon the 3-foot 4-inch seam. The coal seams dip at an angle of 7 per cent toward the west. The power for hoisting is supplied by a 45-horsepower double-cylinder steam engine. Average number of men employed underground, 25; average number of men employed outside, 7; average number of boys employed underground, 3. Spanish-speaking natives of New Mexico are employed outside. Various nationalities employed underground—Americans, Irish, Germans, and Italians—all of whom can write, as shown by signatures to vouchers.

The mine was operated 295 days during the fiscal year ending June 30, 1903; total output for fiscal year, 25,000 tons; used in operating mine, 1,000 tons; net product, 24,000 tons; estimated value of product at mine, $36,000. The coal is nearly all sold to the Denver and Rio Grande Railroad for operating purposes. A small proportion of the product is marketed in the San Luis Valley, Colorado, and near-by camps, and some is sold in Santa Fe, N. Mex.

The strike lessened the production of the Monero mine to the extent of 500 tons. The demand for coal in this immediate vicinity is greater than the production, scarcity of miners being the principal factor in restricting production.

RECORD OF INSPECTION.

October 21, 1902.—Inspected Monero mine, inspected machinery, cars, cable, etc., in use upon mine. Instructed engineer to examine inside of boiler at first opportunity, when the boiler is emptied for any purpose. Instructed him to examine shell of boiler carefully to ascertain if the plates are pitted through scaling by foul water. If plates are pitted, present pressure, 90 pounds, would be too great. Found trip running without a drag. Instructed that a drag be placed on every trip hoisted.

October 23, 1902.—Inspected Monero mine. Air intake 11,760 cubic feet per minute. Air well distributed to working faces; 15 men employed underground. Found mine in good condition.

January 17, 1903.—Inspected Monero mine; inspected machinery, cars, cable, etc., in use upon mine. Found same in fair condition.

January 20, 1903.—Inspected Monero mine. Air intake 15,120 cubic feet per minute; air well distributed; 20 men employed underground. Found that portions of entry and all rooms were insufficiently timbered. Gave instructions to timber mine properly.

May 22, 1903.—Inspected machinery, cars, cable, etc., in use upon Monero mine. Found same in fair condition except cable, in which there are four eye-splices, which I consider dangerous. Instructed engineer to watch that cable wires did not break off at eye-splices.

May 25, 1903.—Inspected Monero mine. Air traveling in main slope 11,375 cubic feet per minute; air not well distributed to working faces, nor carried to bottom of main slope; 18 men employed underground. Air traveling at last crosscut between rooms on right of slope, about 70 feet from bottom of slope, 750 cubic feet per minute. Gas CH_4 blowing from several small vents in bottom of slope. One gas feeder being burned through an inch pipe 20 feet from bottom of slope. Instructed Andy Daly and Joseph O'Neal, contractors in charge, that constant care and watchfulness must be observed that no person be burned or otherwise injured by ignition or explosion of gas.

McBROOM MINE.

The McBroom mine is located in the SE. ¼ of sec. 17, T. 31 N., R. 1 E., New Mexico principal base and meridian. The mine is situated about 1½ miles from Monero Station, on the Denver and Rio Grande Railroad, to which place the coal is hauled upon wagons and thence shipped by rail. The mine is owned and operated by the Rio Arriba Coal Company; J. H. Crist, general manager. The coal of this mine is a good grade of bituminous coal; thickness of coal seam, 3 feet 8 inches; system of working, slope, single entry, room, and pillar; length of main slope, 450 feet, ventilated by furnace shaft; dip of coal seam 8 degrees; mule haulage is used out of mine to

tipple. Average number of men employed inside, 6; average number of men employed outside, 2; number of days mine worked during fiscal year ending June 30, 1903, 250. Number of tons of coal produced during fiscal year, 4,500; estimated value of product at mine, $7,000. The product is disposed of to the Denver and Rio Grande Railroad and to the Biggs sawmill.

RECORD OF INSPECTION.

October 24, 1902.—Inspected McBroom mine. Found ventilating current very weak and instructed that it be improved; 6 men underground. Found men negligent about timbering; gave necessary instructon. Found work upon second opening into mine temporarily suspended. Instructed that work upon second opening be resumed without delay and prosecuted with due diligence.

January 21, 1903.—Inspected McBroom mine. Air intake gave no register on anemometer, but found air good at working faces; 6 men employed underground. Found room worked by Jose Herrera to be in exceedingly bad condition on account of lack of timbering. Instructed that room be properly timbered immediately.

KUTZ MINE.

The Kutz mine is located in NW. ¼ of NW. ¼ of sec. 17, T. 31 N., R. 1 E., New Mexico principal base and meridian. It lies within one-half mile of Monero Station, on the Denver and Rio Grande Railroad, and close by the railroad, which transports all the coal from the mine to market. The mine is owned and operated by George W. Kutz, who is general manager of the property, with office at Lumberton, Rio Arriba County, N. Mex.; George Ray, superintendent, Monero, N. Mex.

There are two known veins upon this property, the upper vein being 4 feet and the lower vein 3 feet 10 inches in thickness; dip of coal seams, 11 per cent; system of working, slope, single entry, room, and pillar, ventilated by furnace and air shaft. Depth of slope, 900 feet. A 30-horsepower steam engine is used for haulage from mine to tipple. Average number of men employed underground, 15; average number of men employed outside, 3. Nationality of employees: Americans, Irish, Italians, and Mexicans, all of whom could write, as indicated by signatures to vouchers. Number of days mine was operated during fiscal year ending June 30, 1903, 220; total output, 9,600 tons; slack for fuel at mine, no account of which was kept; net product, 9,600 tons; estimated value at mine, $15,000.

The coal is sold to the Denver and Rio Grande Railroad, and in the San Luis Valley, Colorado, and Santa Fe, N. Mex. In July and August, 1902, operation of the Kutz mine was suspended three weeks on account of an explosion of gas, on July 24, by which three men were badly burned and two others slightly injured.

On January 27, 1903, the United States mine inspector for New Mexico deemed it his duty to apply for an injunction restraining and forbidding operation of this mine until the law requiring a second opening into every coal mine in the Territory was complied with. The application for injunction was heard before Hon. John R. McFie, judge of the first judicial district, at Santa Fe, N. Mex. The injunction was granted and continued in force until March 11, 1903, when second opening was completed, the injunction then being dissolved, the defendant, George W. Kutz, paying the costs of suit. amounting to $111.60.

On June 10, 1903, a strike was commenced, the miners demanding an increase of 5 cents per ton for mining coal. This strike was still on, June 30, 1903. All the three foregoing incidents served to decrease the production of the Kutz mine during the past fiscal year.

RECORD OF INSPECTION.

October 22, 1902.—Inspected Kutz mine. Air intake, 6,050 cubic feet per minute; 13 men employed underground. Investigated progress of second opening into the mine; result of investigation set forth in letter to Hon. M. A. Otero, governor of New Mexico. Found mine well timbered; no gas; no dust; ventilation fair.

January 19, 1903.—Monero, N. Mex. Found operation of Kutz mine suspended on account of influx of water on first left entry, water coming in from second opening being driven. Took measurements necessary should suit be instituted by the United States Government to compel obedience to the law.

January 22, 1903.—Monero, N. Mex. Went to Kutz mine in forenoon and afternoon, and endeavored by persuasion to induce more rapid work toward completion of second opening into Kutz mine, as I believe that in official or Government business, as well as in personal business affairs, it is better to avoid lawsuits or legal proceedings where possible without neglect of duty.

January 23, 1903.—Monero, N. Mex. Visited Kutz mine to ascertain if second opening was completed. Found that it was still uncompleted, and can see no alternative but apply for an injunction against operating the mine until a second opening is completed in proper shape.

January 27, 1903.—Santa Fe, N. Mex. Completed preparation of documentary evidence in case of United States of America *v.* Geo. W. Kuts & Co., and made application for injunction through Hon. W. B. Childers, United States attorney for New Mexico. Application for injunction made before Hon. John R. McFie, associate justice of the supreme court of New Mexico, and judge of the first judicial district, in which district said Kutz mine is located. Temporary injunction granted, and order made by the court that Geo. W. Kutz & Co. appear before the court on February 25, 1903, and show cause why injunction should not be continued.

February 25, 1903.—Santa Fe, N. Mex. Attended court in injunction proceeding United States of America *v.* Geo. W. Kutz & Co. Defendant did not appear, the court ordered injunction continued until further orders of the court.

March 6, 1903.—Delayed upon train by severe snowstorm on Cumbres Range en route between Antonito, Colo., and Monero, N. Mex. Train arrived at Monero, N. Mex., 10.30 p. m., eleven hours late; hence could not keep appointment to inspect second opening into Kutz mine.

March 7, 1903.—Inspected Kutz mine. Air intake, 6,600 cubic feet per minute; air not well distributed to all working faces; 14 men employed underground.

Inspected second opening into Kutz mine. Found that while said second opening is passable at present, yet it will be necessary to timber said opening for 40 or 50 feet nearest surface to prevent the loose sides and top from caving. George Wray, superintendent of Kutz mine, promised to make the necessary improvements upon said second opening.

March 11, 1903.—Santa Fe, N. Mex. Through Hon. W. B. Childers, United States attorney for New Mexico, I presented my report upon condition of second opening into Kutz mine, and recommended that the injunction against operation of said mine be dissolved, as the requirements of the law have been complied with. The court dissolved the injunction, assessing the costs against the defendant, Geo. W. Kutz & Co., amounting to $111.60. The costs being paid by defendant, the case was dismissed.

May 23, 1903.—Inspected Kutz mine. Air intake, 5,775 cubic feet per minute; 15 men employed underground; air well distributed. Found two rooms badly timbered; gave instruction to timber same properly. Mine otherwise in good condition.

SANTA FE COUNTY.

Santa Fe County ranks fourth among the coal-producing counties of New Mexico. The coal measures of this county merit and have attracted more attention than the coal fields of any other county in New Mexico. This is due not to the extraordinary extent of the coal beds, but to the peculiar geological conditions which there prevail. In the immediate vicinity of the town of Madrid are found strange and anomalous coal beds.

The bituminous and anthracite coals occur in juxtaposition in the same coal seam. The younger coal seams of the series are sometimes highly metamorphosed and anthracited, while the older veins have not passed the bituminous stage. In some instances a part of a coal vein may be anthracite, while a few hundred yards distant, laterally, the same vein may produce bituminous coal. The geological peculiarities of these coal measures are due to the action of intrusive sheets of porphyrite, the near approach of which in places furnished the agency for local metamorphism of the coal measures, thus producing the anthracite coal here found.

The coal produced from the Cerrillos Bituminous (Cook & White) mine has until recently been a noncoking coal, but it was found that at a depth of about 2,600 feet, in the slope, the coal had changed to a very good coking coal. This change would indicate the nearer approach to one of the intrusive sheets, and the possible change from bituminous to anthracite coal as closer approach is made to the intrusion.

The principal mines of the district are the Cerrillos Bituminous, formerly known as the Cook & White, and the Cerrillos Anthracite, formerly called the Lucas mine.

The mines just named demand and receive constant attention from the mine inspector. This necessity arises from the fact that these are among the few dangerously gaseous mines in the Territory.

New developments in other coal areas of Santa Fe County have attracted much attention during the past year. The Una del Gato, Coyote, and Pinavititos coal field has proven to be an area of great value as well as of considerable extent, which will be found more fully described in the description of that field in pages hereinafter. The gross product of Sante Fe County for the past fiscal year was 97,359 tons,

a decrease of 6,102 tons from the production of the preceding year. This decrease of production was due to the suspension of operation and development upon the lower entries of the Cerrillos Bituminous mine, which suspension was caused by the fire in that part of the mine a year ago. The mine has been allowed to fill with water in that section and is now flooded in the locality where the fire burned. It is more than probable that operation and development of these lower areas will soon be resumed and that the increased production from this mine, together with the output from the Una del Gato and adjacent coal mines, will show a large increase in the production of Santa Fe County during the ensuing year.

CERRILLOS BITUMINOUS NO. 27 MINE.

The Cerrillos Bituminos mine is located in T. 14 N., R. 7 E., New Mexico principal base and meridian. It is situated at Madrid, a town at the end of a spur of the Atchison, Topeka and Santa Fe Railroad, 3 miles in length, which connects with the main line at Waldo Station.

The mine is operated by the Colorado Fuel and Iron Company, John T. Kebler, general manager, Boston Building, Denver, Colo.; James Lamb, superintendent, Madrid, N. Mex.; Wm. West, pit boss.

The mine is opened by triple slopes 2,911 feet in depth, driven at an angle of 15°, the direction of dip of the coal seam. Main entries or levels are driven from the main slope at intervals of 600 feet, and these entries are intersected by planes driven to the raise and on the dip, parallel to the main slope and at intervals of 600 feet as the entries depart from the main slope. Thus the field is blocked into 600-foot squares. Back entries are driven parallel to main entry, and cross entries connect the main and back entries, maintaining a thorough system of ventilation. From the dip and raised planes rooms are turned 300 feet in length by 20 feet in width, a pillar of 30 feet being carried between rooms. This pillar is taken out in retreating after the rooms from planes have made junction at the middle between two planes. Compressed-air engines hoist the product from the dip planes, or it is lowered by gravity to the entry below as soon as connection is made with the rooms above, whichever may be found most convenient and economical. The mine is ventilated by two exhaust fans, 14 and 16 feet, respectively, located upon fan shafts connecting with and exhausting from the extremities of the lateral openings from the main slope. The main slope is the intake, the air splitting at or near the bottom. The mines of this camp are among the few mines of New Mexico in which CH_4 is found in sufficient quantity to be very dangerous, but so efficient have been the methods of ventilation employed under the present management, and so carefully are they guarded, that these mines are as safe as if no gas were present, and they will so continue to be as long as the same vigilance is exercised as now.

A battery of 7 boilers furnishes steaming capacity of 750 horsepower. The mine is equipped with a first-class haulage plant, a pair of Hews & Philips Corliss engines of 150 horsepower each, furnishing the power. An Ingersoll-Sargent engine, 100 horsepower, runs 2 large Ingersoll-Sargent air compressors; 2 fan engines, one 50 and one 35 horsepower; 1 blacksmith shop engine, 10 horsepower; 1 engine for forced draft for boilers, 15 horsepower; 1 pair Lidgerwood hoisting engines, 20 horsepower each, and 1 pair Ottumwa engines, 20 horsepower each, both pair used for hoisting from dip planes to entries in the mine; a total engine capacity of 590 horsepower.

The town of Madrid has a population of about 700, the majority of the men being employed in and about the mines, while many of the boys find employment as drivers, trappers, and slate pickers at the anthracite breaker of the Cerrillos anthracite mine. The town has a public hall, excellent school, and 2 churches. In connection with the educational facilities of this coal camp and the aid afforded by the Colorado Fuel and Iron Company in educating the children of the employees, an incident which came under the notice of the mine inspector is pertinent. On the 16th of March, 1903, the town of Madrid was placarded with invitations of the Dorcas Ladies' Aid Society of Cerrillos, a town 3 miles distant, requesting the residents of Madrid to attend an entertainment to be given for the benefit of the school fund of that town, that the teachers might be employed during the full term, the school fund of the county being exhausted. If other means for providing the teachers' salaries were not successful the schools would have to close. The same morning the writer overheard the superintendent of the Colorado Fuel and Iron Company coal mines at Madrid say to the clerk in the office: "Here is a letter from Dr. Corwin telling us to charge the salaries of two school teachers and a janitor to the sociological department of the Colorado Fuel and Iron Company." Both towns, Cerrillos and Madrid, are in Santa Fe County and share the same school fund, and the circumstances attending the scarcity of school funds were identical in both towns; but Cerrillos,

which was not under control or protection of a soulless corporation, had to seek aid from extraneous sources, while Madrid schools were provided for by a company which receives a goodly share of condemnation as a soulless corporation. Nor is this an isolated instance of consideration for its employees by the managers of this company. At Gallup, the American Fuel Company is under the same general manager as the Colorado Fuel and Iron Company at Madrid, and there the schools have thus been provided for in emergencies for years past. And in many instances of different sorts has the kind consideration of the managers of this company toward the employees been very noticeable, although such acts are always performed without show or ostentation. No person connected with the company supposes that these matters have been noticed, and yet any unprejudiced observer would be constrained to take cognizance of and give credit for them.

The Cerrillos Bituminous mine produces an excellent quality of bituminous coal; thickness of vein, 3½ to 4 feet. Average number of men employed underground, 59; average number of men employed outside, 20; average number of boys employed underground, 5; number of days mine was operated during fiscal year, 285.9. Total output for fiscal year, 47,506.17 tons; amount used in operating mine, 1,769.5 tons; net product, 45,737.12 tons; estimated value of product at mine—$1.70 + per ton—$78,564.91.

The outside employees are Mexicans, Americans, and Italians. Percentages of each nationality who could write, as indicated by signatures to vouchers, Mexicans, 90 per cent; Italians, 92 per cent; Americans, 99 per cent. The underground employees are Italians, English, Scotch, Mexican, Austrian, German, Americans, and negroes. The percentages who could write, as indicated by signatures, Italians, 92; English, Scotch, and American, 99; Mexicans, 90; Austrians, 92; Germans, 95; negroes, 85 per cent.

The demand for this coal far exceeds the supply, the coal being of a superior quality, a limited working area restricting the production. The product is sold in New Mexico, Colorado, Texas, Arizona, and California, and is shipped via Atchison, Topeka and Santa Fe Railroad. There is little probability that the product of this mine will be increased during the coming year, but after the damage done by the fire of February, 1902, shall have been repaired and the lower entries reopened an increased production may be looked for.

RECORD OF INSPECTION.

September 17, 1902.—Inspected Cerrillos Bituminous mine. Machinery, cars, cable, fans, safety lamps, etc., in use upon mine. Found all machinery and safety lamps in good condition.

September 18, 1902.—Inspected Cerrillos Bituminous mine. Air intake 45,000 cubic feet per minute; air well distributed to working faces; 85 men employed underground. Found mine in good condition; no dust; no standing gas; mine well timbered.

October 28, 1902.—Inspected Cerrillos Bituminous mine. Machinery, cars, cables, safety lamps, etc., in use upon mine. Found all machinery and safety lamps in good condition.

October 29, 1902.—Inspected Cerrillos Bituminous mine. Air intake 39,000 cubic feet per minute; air well distributed to working faces; 85 men employed underground. Found mine in good condition; no standing gas; mine well timbered. Discovered that the shot firers were in the habit of shooting very strong holes which were drilled and loaded by the miners. These tight shots frequently make blown-out shots, which are again loaded by the miners with an excessive charge of powder to bring away the heavy load upon the badly placed shot. Gave instructions to pit boss, Joseph Haskey, that the very dangerous custom of firing those excessively tight shots be condemned. Also that the still more dangerous habit of reloading blown-out holes must be positively forbidden and both rules strictly enforced. The danger of a dust explosion is very great where such pernicious practices as above mentioned obtain in a mine.

November 12, 1902.—Inspected Cerrillos Bituminous mine. Machinery, cars, cable, safety lamps, etc., in good condition.

November 13, 1902.—Inspected Cerrillos Bituminous mine. Air intake, 42,600 cubic feet per minute; air well distributed to working faces; 80 men employed underground. Found mine in good condition; no standing gas, mine well timbered, ventilation good.

January 6, 1903.—Inspected Cerrillos Bituminous mine. Found machinery, cars, cable, safety lamps, etc., in good condition.

January 7, 1903.—Inspected Cerrillos Bituminous mine. Air intake, 52,000 cubic feet per minute; air well distributed to working faces; 76 men employed under-

ground. Found mine in good condition; no standing gas, mine well timbered, ventilation very good.

March 13, 1903.—Inspected Cerrillos Bituminous mine. Found machinery, cars, cable, fans, safety lamps, etc., in use upon mine to be in good condition.

March 14, 1903.—Inspected Cerrillos Bituminous mine. Air intake, 49,200 cubic feet per minute; air well distributed to working faces; 62 men employed underground. Found mine in good condition; no standing gas, mine well timbered, ventilation good.

April 21, 1903.—Inspected Cerrillos Bituminous mine. Found machinery, cars, cable, safety lamps, etc., in use upon mine to be in good condition.

April 22, 1903.—Inspected Cerrillos Bituminous mine. Air intake, 38,400 cubic feet per minute; air well distributed to working faces; 60 men employed underground. Made tests for fire damp at face of fourth right entry, where gas was blowing, but got no cap, as the gas was dispelled by strong ventilating current. Found mine in good condition; no standing gas, mine well timbered, ventilation good.

June 8, 1903.—Inspected Cerrillos Bituminous mine. Air intake, 57,600 cubic feet per minute; air well distributed to working faces; 55 men employed underground. Found mine water coming up into slope from behind fire walls, thus demonstrating that there can be no large body of standing gas behind the fire walls, as the space has all filled with mine water. Found mine in excellent condition throughout; no standing gas, no dust, mine well timbered, ventilation very good.

CERRILLOS ANTHRACITE MINE.

This mine, which is called by the operators the Cerrillos Anthracite "A" 28 mine, is located at the town of Madrid, N. Mex., in T. 14 N., R. 7 E., New Mexico principal base and meridian. The mine was formerly known as the Lucas mine. The mine is operated by the Colorado Fuel and Iron Company; John T. Kebler, general manager; James Lamb, superintendent; Felix Murphy, pit boss.

The coal is first-class anthracite, equal to the best Pennsylvania anthracite; thickness of coal seam, 3 feet; average dip, 18°; system of working, triple slope, double-cross entries, room and pillar; present depth of slope, 2,300 feet, formerly 2,600 feet, but pillars have been drawn and lower 300 feet of workings abandoned on account of depreciated quality of coal encountered, caused by the nearness of lava sheet.

First-class anthracite has been found in diamond drill hole a mile beyond the face of bottom of slope, which it is highly probable would have been encountered if slope had been continued.

In operating this mine the field is blocked into 600-foot squares in the same manner and the coal extracted by the same methods as described in the foregoing article upon the Cerrillos Bituminous mine.

Steam and compressed air are used at different points in operating. Three engines are used—one 30 horsepower and two 10 horsepower each.

The mine is ventilated by a double 6-foot Murphy exhaust fan, located upon the north side of the main slope, the air intake being through main slope, splitting near the bottom, the air from the south side of slope returning through an overcast cross slope to the return airway on the south side. The mine is equipped with a first-class hoisting plant, consisting of one pair Frazer & Chalmers hoisting engines, 100 horsepower, at the surface; two pair Lidgerwood hoisting engines underground, 40 horsepower; one fan engine, 15 horsepower. Steam is used for the hoisting engine at the surface and fan engine, and compressed air for the other engines. The breaker plant, where the coal is broken and assorted into the various sizes—grate, egg, stove, nut, and pea—is one of the most complete to be found anywhere. The breaker machinery is run by a 40-horsepower steam engine, with an auxiliary pair of 20-horsepower Lidgerwood engines for hoisting purposes. The building is ten stories in height, the dimensions being 250 feet long, 60 feet wide, and 110 feet high, the top of the breaker being on a level with the mouth of the slope. Storage bins for each of the several sizes of coal are provided at the level of the railroad cars, which are loaded therefrom. These bins have a capacity of 75 tons each. Average number of men employed underground, 40; average number of boys employed underground, 2; nationality of underground employees, Italians, French, Americans, English, and Mexicans; average number of men employed outside, 14 at mine, 6 at breaker; average number of boys employed outside, 1 at mine, 12 at breaker; nationalities of employees outside, Italians, Swede, French, Mexican, American, English, and Scotch. Percentage of different nationalities who could write, as indicated by signatures to vouchers: Americans, French, English, and Scotch, 99 per cent; Swedes, 95 per cent; Italians, 92 per cent; Mexicans, 90 per cent. Number of days mine operated during fiscal year, 294½; total output for fiscal year, 35,621 tons; number

of tons used in operating mine, 7,250; net product, 28,371 tons; estimated value of product at the mine, at an average of $2.97+ per ton, $84,517.65. The coal is marketed in Kansas, Colorado, New Mexico, Texas, Arizona, and California. The product is shipped from the mine via Atchison, Topeka and Santa Fe Railroad. The demand for this coal is far in excess of the supply, the output being restricted by limited capacity of the mine. There is little probability that the production of this mine can be increased, everything indicating a dimunition in production.

The Cerrillos Anthracite mine is operated upon a coal bed overlying the Cerrillos bituminous seam, being separated by strata of sandstone of about 150 feet in thickness. On top of the Cerrillos anthracite coal, and separated from it by sandstone strata 30 or 40 feet in thickness, is found the cause of the metamorphism of this coal bed, viz, an intrusive sheet of porphyrite about 350 feet in thickness. On top of this intrusive sheet and only separated by a light stratum of sandstone another seam of anthracite coal is found, 4 feet 2 inches in thickness, which is operated in the Anthracite "B" No. 33 mine. These coal veins produce anthracite coal equal in quality to the best produced in Pennsylvania.

RECORD OF INSPECTION.

September 22, 1902.—Inspected Cerrillos Anthracite "A" 28 mine. Found machinery, cars, cable, etc., in good condition; air intake, 12,860 cubic feet per minute; air well distributed to working faces; 37 men employed underground. Found mine in good condition; no standing gas in operated portion of mine; mine well timbered.

October 30, 1902.—Inspected Cerrillos Anthracite "A" 28 mine. Found machinery, cars, cable, etc., in use upon mine in good condition. Air intake, 9,600 cubic feet per minute; air well distributed, except in slant or raised plane at end of sixth right entry, where ventilation was weak; instructed that it be improved; 55 men employed underground. Found mine in good condition; no standing gas, mine well timbered.

January 9, 1903.—Inspected Cerrillos Anthracite "A" 28 mine. Found machinery, cars, cable, etc., in use upon mine in good condition. Air intake, 10,800 cubic feet per minute; air generally well distributed, but ventilation still weak and deficient at face of slant from end of sixth right entry. Again instructed that ventilation be improved at this place. Mine in good condition; no standing gas, mine well timbered.

March 16, 1903.—Inspected Cerrillos Anthracite "A" 28 mine. Found machinery, cars, and equipment of mine all in good condition, except the cable, which was considerably worn, although not at all dangerous. Called attention of the superintendent to the worn condition of the cable, that it might be replaced by a new one ere it became dangerous. He informed me that a new cable had been ordered to replace the one now in use. Air intake, 14,400 cubic feet per minute; air well distributed to working faces; 34 men employed underground. While at mine, 3 p. m., George Devito was killed in second room off slope, below sixth left entry. (See accident report.) Found mine in good condition; no standing gas, mine well timbered, ventilation good.

April 23, 1903.—Inspected Cerrillos Anthracite "A" 28 mine. Found machinery, cars, and equipment in good condition. Air intake, 9,400 cubic feet per minute; air well distributed to working faces, but ventilating current weaker than usual. Advised pit boss, Felix Murphy, to investigate cause of lesser volume of air traveling than usual. Forty-three men employed underground. Mine in good condition; no standing gas, mine well timbered.

June 9, 1903.—Inspected Cerrillos Anthracite "A" 28 mine. Found machinery, cars, cable, etc., in good condition. Air intake, 13,440 cubic feet per minute; air well distributed to working faces; 35 men employed underground. Found mine in good condition; no standing gas, mine well timbered, ventilation very good.

CERRILLOS ANTHRACITE "B" NO. 33 MINE.

This mine is located about 1 mile east of the town of Madrid, N. Mex., in T. 14 N., R. 8 E., New Mexico principal base and meridian. It is operated by the Colorado Fuel and Iron Company; John T. Kebler, general manager; James Lamb, superintendent; Felix Murphy, pit boss.

A 40-pound rail tramway, about 1 mile in length, connects the mine with the breaker on the Cerrillos Anthracite "A" 28 mine in the town of Madrid. The coal produced is an excellent quality of anthracite; thickness of coal seam, 4 feet; dip of vein, 9 per cent; length of slope, 535 feet. At this depth the coal was cut out by the intrusive porphyrite sheet. From the general indications it would appear that this,

as well as another segregated patch of coal, were thus located by being broken from the main body and floated to this place upon the lava lake and stranded upon top of the lava sheet in cooling, while the main coal bed from which it was broken lies beneath the lava sheet. The mine was opened by a triple slope, double-cross entry, room and pillar system. It is ventilated by Murphy exhaust fan. Compressed air is used. It is conveyed by pipe line from compressor house at Madrid. Capacity, 40 horsepower; one 20-horsepower engine is used for haulage from the mine to the parting on top, from whence the trips are hauled to the breaker by mules. Work was suspended upon the main slope and workings of this mine a year ago. The property was operated through the Martin entry, a new prospect opened across the arroyo from the main slope on this mine. The coal seam at this point is nearly horizontal. It is opened by a drift which has attained a length of about 535 feet and shows 4 feet of clean, hard, anthracite coal of excellent quality, but each entry is limited in length by the lava sheet which has been encountered in all entries thus far driven. The prospects for a long continuance of production are not favorable. Average number of men employed underground, 8; average number of men employed outside, 4. Nationality of employees, Italians and Americans. All could write, as shown by signatures to vouchers. Number of days mine operated during fiscal year, 305.5. Total and net output for fiscal year, 9,232 tons; estimated value at mine, at an average of $2.31+ per ton, $21,392.17. The product is marketed in New Mexico, Arizona, California, Colorado, and Texas.

RECORD OF INSPECTION.

September 20, 1902.—Inspected Anthracite "B" No. 33 mine. Machinery, cars, cable, etc., in good condition, Air intake, 5,000 cubic feet per minute; air well distributed to working faces; 10 men employed underground. Found mine in good condition; no gas, no dust, mine well timbered.

October 31, 1902.—Inspected Anthracite "B" No. 33 mine. Air intake, 5,000 cubic feet per minute; air well distributed to working faces; 11 men employed underground. Machinery, cars, cable, etc., in good condition; mine well timbered; no gas, no dust; ventilation good.

January 8, 1903.—Inspected Cerrillos Anthracite "B" No. 33 mine. Machinery, cars, cable, etc., in good condition. Air intake, 4,800 cubic feet per minute; air well distributed to working faces; 11 men employed underground. Found mine in good condition; no gas; mine well timbered; ventilation good.

March 17, 1903.—Inspected Cerrillos Anthracite "B" No. 33 mine. Air intake erratic and unsteady; average about 3,000 cubic feet per minute; air well distributed to working faces; 9 men employed underground. Machinery and equipment in good condition. Found mine, in general, in good condition, except in two rooms where men were careless about timbering. Gave necessary instructions.

June 10, 1903.—Inspected Cerrillos Anthracite "B" No. 33 mine. Machinery, cars, cable, etc., in use upon mine in good condition. Air intake erratic and air current baffling, but air good at working faces; 7 men employed underground. Found mine in good condition, well timbered, no gas.

SYNOPSIS OF RULES IN FORCE AT CERRILLOS MINES.

The rules in force at the Cerrillos mines, at Madrid, N. Mex., are the same as are generally in force at all coal mines.

Miners are compelled to keep their working places safe, and timber is delivered in their places to make safe.

Miners are allowed to take 5 pounds, and no more, of powder into the mine in any one day.

All employees are forbidden to ride on trips in or out of the mines. The usual rules of inspection by mine foremen and fire bosses are rigidly enforced.

In the bituminous mine shot firers are employed, and all shots are fired after miners quit and miners are out of the mine.

UNA DEL GATO COAL FIELD.

The Una del Gato, Coyote, and Pinavititos coal fields are at present attracting much attention among local coal operators. While the three names are used to designate the three localities within the area of the coal field, yet the outcrop is continuous and identical throughout all three coal areas as divided by imaginary lines and under different names.

This coal field is probably a portion of the same coal series as the Madrid or Cerrillos mines, interrupted by the uplift of the Cerrillos Mountains on the northeast.

As the anthracite coal of the Cerrillos field is due to the rapid metamorphism produced by igneous intrusions, it is far more than probable, considering the igneous surroundings of the Una del Gato field, that anthracite coal will be found in this field by development in localities nearer to the uplift of the Cerrillos and San Pedro ranges.

The outcrop of the Una del Gato Coal Measures, showing four workable coal seams 3½ to 4½ feet in thickness, extends a distance of about 9 miles from northwest to southeast, diagonally across T. 13 N., R. 6 E., from sec. 6 to sec. 33, inclusive, with an almost continuous outcrop along an irregular line between the sections named. Two of the coal seams have from one to three dirt bands along the outcrop, but upon the Una del Gato mine, the only place the field has been developed to any great extent, the dirt band pinched out at a depth of 260 feet.

About 12,000 acres, or more than half of T. 13 N., R. 6 E., has been already filed upon as coal lands, and about 2,000 acres of it has been purchased from the Government at $20 per acre.

UNA DEL GATO MINE.

The Una del Gato coal mine is located in lot 2 of sec. 33, T. 13 N., R. 6 E., New Mexico principal base and meridian. It is owned by E. B. Field, of Santa Fe, N. Mex., and operated by the New Mexico Fuel and Iron Company, Santa Fe, N. Mex.; W. S. Hopewell, general manager, Santa Fe, N. Mex.; Thomas Ramsay, superintendent, Hagan, Sandoval County, N. Mex.

A branch line 15 miles in length is being built to connect the mines with the Santa Fe Central Railroad; a survey has also been made for a branch line 12 miles in length to connect the mines with the Atchison, Topeka and Santa Fe Railroad at a point near Algodones station.

Four coal seams have been shown in the Una del Gato mine, ranging from 3½ to 5 feet in thickness. These coal veins are known by the following names, in the order of their occurrence in depth from the surface, viz, McCance, Kennedy, Hopewell, and Andrews.

Only one coal vein is being developed at present, the Hopewell. Thickness of vein, 4 feet 6 inches of clean coal without band of any kind; dip of vein, 15°; system of working, triple entry slope, double cross entries, and room and pillar.

The coal is a good quality of bituminous coal, especially desirable for domestic purposes, as it is a free-burning coal, giving a white ash, and without clinker. It is quite probable that there will be an extraordinary demand for it, and that this coal will be substituted for many other coals now used in the Southwest for domestic purposes as soon as railroad transportation facilities are completed so that it may be placed in the market. The mine was operated 180 days during the fiscal year, upon development work only. Depth of main slope, 710 feet; number of men employed underground, 8; number of men employed outside, including carpenters, mechanics, and laborers on work of construction, 12.

The prospects for the future of this mine are very bright, by reason of it being closer than competing mines to both home markets, and also closer to foreign markets of the Southwestern and Western States and Territories, which furnish the market for the great majority of the coal mined in New Mexico.

On account of lack of railroad transportation facilities no coal was mined except such as was absolutely necessary in development work.

During the past fiscal year a temporary hoisting plant, with 30-horsepower steam engine, was erected; also boarding house, bunk house, blacksmith shop, store, office, cottages, and stable.

Considerable development and improvements were made in a short time and with few facilities, but the obstacles now encountered will be eliminated with the advent of the first railroad, and the men who have used such strenuous endeavors to open this valuable coal field will be well repaid for their efforts.

RECORD OF INSPECTION.

January 14, 1903.—Inspected Una del Gato mine. Air intake, 2,500 cubic feet per minute; 7 men employed underground. Depth of slope, 362 feet; air good at bottom of slope. Instructed that second opening at least 150 feet distant be made in compliance with the United States law for protection of miners in the Territories. Found men working under dangerous roof near bottom; instructed that it be made safe; no gas; no dust.

March 18, 1903.—Inspected Una del Gato mine. Air intake, 8,400 cubic feet per minute; 11 men employed underground. Depth of slope, 500 feet; air good at bottom of slope; no gas; no dust; mine well timbered.

June 4, 1903.—Inspected Una del Gato mine. Ventilation weak and erratic but air good at bottom of slope. Depth of slope 650 feet. No dust; no gas; mine well timbered. New opening being made to comply with law requiring second opening into mine.

Investigated circumstances attending accidental death of Samuel O'Bannon, who was killed by fall of coal from rib of mine slope on May 25 ultimo. From testimony of eyewitnesses the accident was due to negligence of deceased in not stepping out of the proximity of danger when informed by Harry Maurry that the coal was about to fall. Instead of stepping out of the way of the danger he turned to look at the threatened danger in a leisurely and deliberate manner, and was struck by a piece of the falling coal and thrown against a car close by, being injured so that death ensued in a few hours.

BLOCK COAL MINE.

The Block coal mine is located in SW. ¼ of SE. ¼, SE. ¼ of SW. ¼, NE. ¼ of SW. ¼, NW. ¼ of SE. ¼, SE. ¼ of NW. ¼, and S. ½ of NE. ¼ of sec. 32, T. 13 N., R. 9 E., New Mexico principal base and meridian. It is owned and operated by the estate of Leonard Lewisohn. Address of owner, New York City, N. Y. Richard S. McCaffrey, general manager and agent of estate of Leonard Lewisohn; address, San Pedro, Santa Fe County, N. Mex. The new slope is in the NE ¼ of SW. ¼ of sec. 32, T. 13 N., R. 9 E. It is about 16 miles southeast from Madrid, N. Mex., by wagon road, and about 12 miles from San Pedro, the product of the mine being used at the Santa Fe Gold and Copper Company's metal mines at the latter-named place, the coal being hauled in wagons. Operation of the metal mines has been suspended during the past fiscal year, hence there was no market for the product of the Block coal mine, and it was not operated, the mine being too far from railroad transportation to place coal in other markets for sale.

Kind of coal, bituminous; thickness of coal seam, 2½ feet; dip of seam, 11°; system of working slope, single entry, room and pillar; depth of slope, 600 feet; ventilated by air shaft; haulage by horse whim.

SAN JUAN COUNTY.

There is little doubt that the coal measures developed and operated at Gallup, McKinley County, N. Mex., extend, with little interruption, across San Juan County, from south to north, to the Colorado line.

The coal seams of this county, where developed, are larger than has been found in any other section of New Mexico, ranging from 6 feet to 40 feet in thickness, of good marketable coal.

STEVENS MINE.

The Stevens mine is located in T. 29 N., R. 15 W., New Mexico principal base and meridian. It lies about 2½ miles from the town of Fruitland, on the San Juan River. The mine is owned by E. S. Young. It is operated under lease by Thomas Evans, address Fruitland, San Juan County, N. Mex.

The nearest railroad point is Durango, Colo., 70 miles distant by wagon road. Kind of coal, bituminous; thickness of coal seam, 12 feet, 10 feet of which is clean, marketable coal, lying horizontal; system of working—drift, entry, room, and pillar; extent of workings—main drift, 350 feet; right entry, 150 feet; left entry, 150 feet.

No data in regard to production of this mine was obtainable, but as information from other sources than the operators rendered it certain that the mine is operated, credit has been given for production the same as last year, which amount is more likely below than above the actual production. Average number of men employed underground, 2; number of days mine was operated during fiscal year, 230; total output, 1,100 tons; estimated value at mine, $1,375. The product is sold in the towns of Fruitland and Farmington and to farmers of the San Juan Valley.

THOMAS MINE.

The Thomas mine is located in T. 32 N., R. 13 W., New Mexico principal base and meridian. W. H. Thomas, owner and operator; address, La Plata, San Juan County, N. Mex. The nearest railroad point is La Boca, on the Denver and Rio Grande Rail-

road, about 45 miles distant. This coal seam is the thickest coal vein in the Territory. At the Thomas mine it is about 60 feet in thickness, with 40 feet of good, marketable coal. The vein at this point is faulted, and the upthrow shows a transverse section of the seam, the dip of which is about 25 degrees. The development consists of a drift entry driven across the dip; length of drift, about 300 feet; natural ventilation. Number of days mine was operated, 175; number of men employed underground, 2; number of boys, 1. Output for fiscal year, 700 tons; estimated value at mine, at $1.50 per ton, $1,050. The product is sold to the farmers of the La Plata Valley and vicinity and at Aztec, N. Mex. Value of improvements during fiscal year, $250.

MORGAN MINE.

In the Morgan mine, about 1 mile distant from the Thomas mine, the same great coal seam, 40 feet in thickness, is being exploited; but operation is suspended at present. This mine is worked intermittently, as coal may be in demand by the farmers.

BRUCE MINE.

The Bruce mine, near Jewett, N. Mex., about 10 miles west of the Thomas mine, has produced some coal for market. It is located upon a vein 6 feet in thickness, and the coal is of good quality.

Several other prospect mines have been opened at different points within a length of 40 miles; but few are in operation, as there is little demand for the product, and these are only operated a short time each year.

In the fall of 1901 a railroad survey was made from Durango, Colo., to Clifton, Ariz., via the San Juan Valley, and passing through the center of the coal fields for fully 80 miles or more of its length. The project is receiving much attention. Two other surveys have since been made, by other persons who have become interested in the great possibilities of the immense coal fields. If the road be built it will cause the immediate development of the coal mines.

SAN MIGUEL COUNTY.

San Miguel County has not yet made a record as a coal-producing county for the reason that no coal has yet been marketed, but considerable development work is being done in the coal fields lying within 25 or 30 miles of the eastern boundary line of Santa Fe County. These coal areas have been credited with the Santa Fe County coal measures in the aggregate of coal areas of New Mexico.

PECOS COAL MINE.

The Pecos coal mine is located in E. ½ of sec. 5, T. 16 N., R. 12 E., New Mexico principal base and meridan. It lies in the northwestern part of San Miguel County, N. Mex. It is owned by J. L. Wells and W. P. Gould; address, Cerrillos, Santa Fe County, N. Mex. A good wagon road leads from the mine to Pecos station, on the Atchison, Topeka and Santa Fe Railroad, a distance of about 10 miles. The coal is a good quality of bituminous, and makes excellent coke. Thickness of coal seam, 3 feet; dip of coal seam, 5 degrees. System of working—slope, single cross entry, room, and pillar; depth of main slope, 273 feet; cross entry, 173 feet. Natural ventilation. The mine was worked intermittently only a very short time during the fiscal year. Two men employed underground. Total product for fiscal year, 500 tons. None of the product was marketed.

EL PORVENIR MINE.

The El Porvenir mine is located in secs. 12 and 13, T. 17 N., R. 14 E., New Mexico principal base and meridian, on the Las Vegas grant, and about 8 miles from Las Vegas, the nearest railroad station. Prospecting with a diamond drill has shown encouraging results. Four men are employed in development work. No coal has yet been marketed. About $4,000 has been invested in machinery and development work.

SOCORRO COUNTY.

Socorro County ranks sixth among the coal-producing counties of New Mexico. The coal operators of this county are handicapped by having to haul their product

12 miles to the nearest railroad point, San Antonio station, on the Atchison, Topeka and Santa Fe Railroad. But, on the other hand, they have the advantage over competitive operators of being 150 miles nearer to market. With a railroad into this field the operator would have a considerable margin of profit over other fields. The coal is bituminous and of excellent quality for steam and for domestic purposes, and makes excellent coke.

HILTON MINE.

The Hilton mine is located in NE. ¼ of sec. 15, T. 5 S., R. 2 E., New Mexico principal base and meridian. It is situated about 12 miles southeast from San Antonio station, on the Atchison, Topeka and Santa Fe Railroad, to which place the product is hauled by wagon, thence shipped by rail to markets in old Mexico, Texas, Arizona, and New Mexico. The property is owned by A. H. Hilton, M. L. Hilton, John Laubersweiler, and Anastacio Mora. The firm name generally used is the Carthage Coal Company; A. H. Hilton, general manager; address, San Antonio, N. Mex. The mine is operated by the A. H. Hilton Mercantile Company, of San Antonio, N. Mex.; Robert E. Law, mine superintendent.

Eighteen small seams, ranging from 1 inch to 8 inches in thickness, are found in the borings in this field. One vein of workable thickness, 5 feet, has been developed and operated; average dip of vein, 15 degrees; system of working, slope, single entry, room, and pillar. Depth of main slope, 750 feet, ventilated by air shaft. Steam power is used to haul loaded trip from mine to tipple. No data obtainable in regard to operation of the mine during fiscal year, but from the knowledge of the mine inspector in regard to the operation of the mine the statistics of last year are considered a very close approximation, and are given below.

Average number of men employed underground, 30; average number of men employed outside, 6; nationality of employees, Spanish-speaking natives predominate, with a few Scotch and Italians. All employees could write, as shown by signatures to vouchers. Number of days mine operated during fiscal year, 275; total output, 20,375 tons; amount used in operating mine, 375 tons; net product, 20,000 tons; estimated value of product at mine, $26,000. A 50-horsepower steam engine is in use upon the mine.

RECORD OF INSPECTION.

March 28, 1903.—Inspected Hilton Mine, also known as Carthage Coal Company's mine. Air intake, 4,200 cubic feet per minute; air poorly distributed; ventilation weak at working faces; 25 men employed underground. Machinery in good condition; mine well timbered; no gas; no dust.

May 18, 1903.—Inspected Hilton mine. Air intake, 7,800 cubic feet per minute; air poorly distributed; ventilation weak at working faces; 25 men employed underground. Found way to escape shaft tortuous and hard to follow; instructed that wire be strung from main slope through old workings to escape shaft and that signs be put up directing the way to escape shaft in case of emergency. Found a fire burning in iron basket in escape shaft for the purpose of increasing ventilation, virtually making it a furnace shaft. Instructed that the fire must be extinguished and no more fires lighted in escape shaft or else that a new escape shaft or second opening be made. Machinery in good condition; mine well timbered; no gas. I was informed by A. H. Hilton, general manager, that a fan would soon be installed to improve ventilation.

GOVERNMENT MINE.

The Government mine is located in sec. 15, T. 5 S., R. 2 E., New Mexico principal base and meridian. It inherits the name of the Government mine from the fact that Government troops, camped upon the Rio Grande, worked the mine thirty-five or forty years ago. It is now owned by the Carthage Coal Company, A. H. Hilton, general manager; James Richardson, superintendent. The coal is similar in character to the coal of the Emmerson and Carthage mines. Thickness of coal seam, 6 feet; dip, 13 degrees; depth of slope, 300 feet. A 50-horsepower steam engine is being installed for haulage. Air compressor, to run pump and other necessary uses, will soon be installed. No data obtainable from manager. From knowledge of mine inspector the following data is considered approximately correct: Average number of men employed underground, 8; average number of men employed outside, 3; number of days mine worked, 200; number of tons of coal produced, 4,000; used at mine, none; value of product at mine, $5,200. The coal is sold in El Paso, Tex., for shipment to old Mexico.

RECORD OF INSPECTION.

March 28, 1903.—Inspected Government mine, formerly known as the Duffy mine. Air intake weak and erratic, baffling and traveling alternately in either direction, up and down main slope and air shaft. Ten men employed underground. Air good at working faces. Instructed that measures be taken to improve air current and make it constant in one direction. Instructed that ladder way be placed in air shaft so that it would answer for a second opening for ingress to or egress from the mine. Mine well timbered; no dust; no gas.

May 19, 1903.—Inspected Government mine. Air still erratic and uncertain, traveling alternately in either direction; air good at working faces. Again instructed that air current be rendered certain and constant in one direction. I was informed that a fan would soon be installed to improve ventilation. Twelve men employed underground. Mine well timbered; no gas; no dust.

BERNAL MINE.

This is a new mine being opened by the Carthage Coal Company between the Hilton and the Government mines. Depth of slope, 150 feet; thickness of coal seam, 5 feet 6 inches. There was only one man employed on the property. Mule haulage is employed to bring the coal to the surface. Only a slope being driven to test the coal seam. No shipments.

RECORD OF INSPECTION.

May 19, 1903.—Inspected Bernal mine. Only opening a slope 150 feet in depth to explore and ascertain the value of property. Instructed that if working be continued permanently that a second opening be made as required by law. No gas; no dust; slope in safe condition.

EMMERSON MINE.

The Emmerson mine is located in secs. 9 and 16, T. 5 S., R. 2 E., New Mexico principal base and meridian. It is owned by E. O. Emmerson, J. L. Emmerson, E. O. Emmerson, jr., and C. B. Allaire, general manager; address, San Antonio, Socorro County, N. Mex. The mine is situated about 10 miles southeast of San Antonio station, on the Atchison, Topeka and Santa Fe Railroad, to which point the coal is hauled in wagons and shipped thence by rail to market at El Paso, Tex. The coal is a good quality of bituminous, very good for steam and domestic purposes, and makes an excellent quality of coke. Thickness of coal seam, 6 feet; dip of vein, 15 degrees; system of working, slope, single entry, room, and pillar; depth of main slope, 1,000 feet; ventilation, natural, through slope and two air shafts. The power for operation is furnished by a 25-horsepower gasoline engine. Average number of men employed underground, 25; average number of men employed outside, 3; nationality of employees, mostly Spanish-speaking natives of New Mexico, about 90 per cent of whom could write, as shown by signatures to vouchers. Number of days mine was operated during fiscal year, 135; output for fiscal year, 5,085 tons; estimated value of product at mine, $7,119. This mine is located on the same coal seam as the Hilton mines, which are near by on either side. Borings made in the vicinity of this mine show twelve smaller seams of coal, the largest being 15 inches in thickness.

RECORD OF INSPECTION.

May 18, 1903.—Inspected Emmerson mine. Air intake weak and erratic, but air good at working faces; 28 men employed underground. Found trip running in slope without a drag. Instructed that a drag be put upon every trip hoisted. Mine well timbered; no dust; no gas.

PRICES PAID FOR LABOR, MINING COAL, ETC., DURING THE FISCAL YEAR ENDING JUNE 30, 1903,

BY THE DAWSON FUEL COMPANY,

On the Dawson mines, at Dawson, Colfax County, N. Mex.

Thickness of veins	feet..	7 to 11
Mining coal, per ton of 2,400 pounds, mine run		$0.55
Driving main and back entry; driven by machines, company work.		
Narrow work; done by contract, per yard		1.75

Driving crosscuts, per yard	$1.00
Turning rooms	5.00
Setting timbers: Done by company men.	
Wages paid:	
Pit bosses, per day	4.00
Fire bosses, per day	3.50
Machine men on coal cutting machines	3.50
Helpers on coal cutting machines	2.25
Track layers, per day	3.00
Company timbermen, per day	2.85
General company men, per day	1.75
Company men, underground, per day	2.60
Assistants to company men, per day	2.00
Single mule drivers, per day	2.75
Team drivers, per day	2.85
Boys attending to doors, per day	1.00
Stable boss, per month	65.00
Electricians, per day	3.00
Motormen, per day	2.75
Engineers, per month	90.00
Boiler men, per day	2.50
Weighmen, per day	2.75
Tipple men, per day	$1.75 and 2.00
Blacksmiths, per day	2.75 to 3.00
Blacksmiths' helpers, per day	2.25
Carpenters, per day	3.00
Prices of powder and supplies for miners at the Dawson mines:	
Powder, per keg	2.75
Lamp oil, per gallon	.75
Lamp cotton, per three balls	.25
Squibs, per box	.20
Deductions:	
Doctors, per month	1.00
Blacksmithing, per month	1.00
House rent, 2 rooms, per month	4.00
House rent, 3 rooms, per month	6.00
House rent, 4 rooms, per month	8.00

By the Raton Coal and Coke Company.

On the Willow mine at Van Houten, N. Mex.

Thickness of vein, inches	96
Mining coal, per ton of 2,400 pounds, mine run	$0.55
Driving main entry, per yard	1.75
Driving back entry, per yard	1.75
Narrow work done by company.	
Driving crosscuts, per yard	1.50
Turning rooms	5.00
Setting rough timbers, per set	1.50
Wages paid:	
Pit bosses, per month	90.00
Fire bosses, per month	85.00
Track layers, per day	2.80
Company timbermen, per day	2.80
General company men, per day	2.50
Company men, underground, per day	2.50
Assistants to company men, per day	2.25
Single mule drivers, per day	2.80
Car couplers, per day	2.25
Boys attending to doors, per day	1.10
Stable boss, per month	60.00
Electricians, per month	100.00
Linemen, per month	70.00
Motormen, per day	2.85
Engineers, per month	70.00
Boilermen, per day	1.75
Weighmen, per month	75.00

Wages paid—Continued.	
Tipplemen, per day	$1.75
Blacksmiths, per day	$3.25 and 3.50
Blacksmiths' helpers, per day	3.00
Carpenters, per day	$3.25 and 3.50
Prices of powder and supplies for miners at the Willow mine:	
Powder, per keg	2.50
Lamp oil, per gallon	.70
Lamp cotton, per ball	.05
Squibs, per box	.20
Deductions:	
Doctors, per month	1.00
Blacksmithing, per month	.50
Hospital, per month	1.00
House rent, 2 rooms, per month	3.00
House rent, 3 rooms, per month	4.00
House rent, 4 rooms, per month	6.00

On the Dutchman mine at Blossburg, N. Mex.

Thickness of vein, inches	80
Mining coal, per ton of 2,400 pounds, mine run	$0.55
Driving main entry, per yard	2.50
Driving back entry, per yard	2.50
Driving crosscuts, per yard	1.00
Driving main slope when in natural coal, per yard	2.50
Turning rooms	5.00
Setting rough timbers, per set	1.50
Wages paid:	
Pit bosses, per month	85.00
Fire bosses, per month	85.00
Track layers, per day	2.80
Company timbermen, per day	2.80
General company men, per day	2.50
Company men, underground, per day	2.50
Assistants to company men, per day	2.25
Single mule drivers, per day	2.80
Car couplers, per day	2.25
Boys attending to doors, per day	1.10
Stable boss, per month	70.00
Electricians, per month	100.00
Linemen, per month	70.00
Motormen, per day	2.85
Engineers, per month	70.00
Boilermen, per day	1.75
Weighmen, per month	65.00
Tipplemen, per day	1.75
Blacksmiths, per day	$3.25 and 3.50
Blacksmiths' helpers, per day	2.00
Carpenters, per day	3.00
Prices of powder and supplies for miners at the Dutchman mine:	
Powder, per keg	2.50
Lamp oil, per gallon	.70
Lamp cotton, per ball	.10
Squibs, per box	.20
Deductions:	
Doctors, per month	1.00
Blacksmithing, per month	.25
Hospital, per month	1.00
House rent, 2 rooms, per month	3.00
House rent, 3 rooms, per month	4.50
House rent, 4 rooms, per month	6.00

BY THE NEW MEXICO FUEL COMPANY.

On the Capitan mines Nos. 1 and 2, at Capitan, Lincoln County, N. Mex.

Thickness of vein, inches	60 to 72
Mining coal, per ton of 2,400 pounds, mine run	$0.65

Thickness of vein ..... inches..	48 to 56
Mining coal, per ton of 2,400 pounds, mine run	$0.80
Thickness of vein ..... inches..	42 to 48
Mining coal, per ton of 2,400 pounds, mine run	$1.00
Driving main entry, per yard	4.00
Driving back entry, per yard	3.00
Narrow work, per yard	$3.00 and 3.50
Driving crosscuts, per yard	2.00
Driving main slope when in natural coal, per yard	6.00
Turning rooms	5.00
Setting timbers done by company work.	
Wages paid:	
Pit bosses, per month	90.00
Fire bosses, per day	3.00
Track layers, per day	2.85
Company timbermen, per day	2.75
General company men, per day	1.75
Company men, underground, per day	2.60
Assistants to company men, per day	2.00
Single mule drivers, per day	2.75
Team drivers, per day	2.85
Rope riders, per day	2.75
Boys attending to doors, per day	1.00
Stable boss, per month	65.00
Boilermen, per month	2.25
Weighmen, per day	2.50
Tipplemen, per day	1.75
Blacksmiths, per day	$2.50 and 3.00
Prices of powder and supplies for miners at the Capitan mines Nos. 1 and 2:	
Powder, per keg	3.00
Lamp oil, per gallon	.75
Lamp cotton, per 3 balls	.25
Squibs, per box	.25
Deductions:	
Doctor and hospital, per month	1.25
House rent, 2 rooms, per month	4.00
House rent, 3 rooms, per month	6.00
House rent, 4 rooms, per month	8.00

BY THE CLARK COAL COMPANY.

On the Clark Coal Company mine, at Clarkville, McKinley County, N. Mex.

Thickness of vein ..... inches..	48 to 78
Mining coal, per ton of 2,400 pounds, mine run	$0.70
Driving main entry, per yard	2.00
Driving back entry, per yard	2.00
Narrow work, per yard	1.50
Driving crosscuts, per yard	1.50
Driving main slope when in faults or solid rock, per yard	8.00
Turning rooms	5.00
Setting rough 6 to 8 foot timbers	.50
Wages paid:	
Pit bosses, per day	5.00
Machine men on coal-cutting machines, per day	3.50
Helpers on coal-cutting machines, per day	3.00
Track layers, per day	3.00
Company timbermen, per day	3.00
General company men, per day	$2.50, $3.00, and 3.50
Company men, underground, per day	3.00
Assistants to company men, per day	3.00
Single mule drivers, per day	3.00
Boys attending to doors, per day	1.00
Stable boss, per month	75.00
Electricians, per day	3.00
Linemen, per day	2.75
Motor men, per day	3.25

Wages paid—Continued.	
Engineers, per day	$3.00
Boiler men, per day	2.50
Weigh men, per day	3.50
Tipple men, per day	$1.50 to 2.50
Blacksmiths, per day	3.50
Carpenters, per day	3.50
Prices of powder and supplies for miners at the Clark Coal Company mine:	
Powder, per keg	2.50
Lamp oil, per gallon	.75
Lamp cotton, per ball	.05
Deductions:	
Doctors, per month	1.00
Blacksmithing, per month	1.00
Hospital, per month	.50
House rent, 2 rooms, per month	5.00
House rent, 3 rooms, per month	7.00
House rent, 4 rooms, per month	9.00

By the Caledonian Company.

On the Otero mine, at Gallup, McKinley County, N. Mex.

Thickness of vein inches..	60
Mining coal, per ton of 2,000 pounds, mine run	$0.58
Driving main entry, per yard	1.50
Driving back entry, per yard	1.50
Narrow work, per yard	1.50
Driving crosscuts, per yard	1.50
Turning rooms	4.00
Setting rough timbers; done by day work.	
Wages paid:	
Track layers, per day	3.00
Company timbermen, per day	3.00
General company men, per day	3.00
Company men, underground, per day	3.00
Single mule drivers, per day	3.00
Engineers, per month	85.00
Boiler men, per day	2.50
Weigh men, per day	3.00
Tipple men, per day	$2.25 to 2.50
Blacksmiths, per day	3.00
Blacksmiths' helpers, per day	2.25
Carpenters, per day	3.00
Prices of powder and supplies for miners at the Otero mine:	
Powder, per keg	2.50
Lamp oil, per gallon	.75
Lamp cotton, per ball	.05
Squibs, per box	.05
Deductions:	
Doctors, per month	1.00
Blacksmithing, per month	1.00
Hospital, per month, varies from	$0.25 to .50
House rent, 2 rooms, per month	4.00
House rent, 3 rooms, per month	6.00
House rent, 4 rooms, per month	8.00

By Stephen Canavan, Owner.

On the Rocky Cliff mine, at Gallup, McKinley County, N. Mex.

Thickness of vein feet..	5
Mining coal, per ton of 2,000 pounds, mine run	$0.58
Driving main entry, per yard	2.00
Driving back entry, per yard	2.00
Narrow work, per yard	1.50
Driving crosscuts, per yard	1.50
Driving main slope when in natural coal, per yard	1.50

Driving main slope when in faults or solid rock, per yard	$3.00
Driving raised planes, per yard	None.
Turning rooms	4.00
Wages paid:	
Pit bosses, per month	100.00
Track layers, per day	3.00
Company timbermen, per day	3.00
General company men, per day	3.00
Company men, underground, per day	3.00
Single mule drivers, per day	3.00
Team drivers, per day	3.00
Weigh men, per day	3.00
Prices of powder and supplies for miners at the Rocky Cliff mine:	
Powder, per keg	2.50
Lamp oil, per gallon	.75
Lamp cotton, per ball	.05
Squibs, per box	.25
Deductions: Doctors, per month	1.00

BY THE AMERICAN FUEL COMPANY.

On the Weaver mine, at Gibson, McKinley County, N. Mex.

Thickness of vein, inches	48 to 84
Mining coal, per ton of 2,000 pounds	$0.58
Mining coal, per ton of 2,000 pounds, screened	.71
Thickness of vein, feet	4 to 7
Driving main entry, per yard	$2.00
Driving back entry, per yard	2.00
Narrow work, per yard	2.00
Driving main slope when in natural coal, per yard	2.00
Turning rooms	4.00
Setting rough 6-foot timbers, per set	.50
Setting timbers over 6 feet in length	None.
Wages paid:	
Pit bosses, per month	90.00
Fire bosses, per month	90.00
Shot firers, per month	90.00
Track layers, per day	3.00
Company timbermen, per day	3.00
General company men, per day	2.50
Company men, underground, per day	3.00
Assistants to company men, per day	2.25
Single mule drivers, per day	3.00
Team drivers, per day	3.00
Rope riders, per day	3.00
Car couplers, per day	2.25
Boys attending to doors, per day	1.00
Stable boss, per month	65.00
Engineers, per day	3.00
Boilermen, per day	2.50
Weighmen, per month	90.00
Tipplemen, per day	$2.25 to 2.50
Blacksmiths, per day	3.00
Blacksmiths' helpers, per day	2.50
Carpenters, per day	3.00
Prices of powder and supplies for miners at the Weaver mine:	
Powder, per keg	2.50
Lamp oil, per gallon	.75
Lamp cotton, per ball	.05
Squibs, per box	.25
Deductions:	
Doctors and hospital, per month	1.00
Blacksmithing, per month	1.00
House rent, 2 rooms, per month	4.00
House rent, 3 rooms, per month	6.00
House rent, 4 rooms, per month	8.00

BY GEORGE W. KUTZ.

On the Kutz mine, Rio Arriba County, N. Mex.

Thickness of vein.....inches..	46
Mining coal, per ton of 2,000 pounds, forked coal	$0.65 and $0.70
Driving main entry, per yard	2.00
Driving crosscuts, per yard	2.00
Driving main slope when in natural coal, per yard	3.00
Turning rooms	3.10
Wages paid:	
Pit bosses, per day	3.50
Fire bosses, per day	3.50
Track layers, per day	3.00
Company timbermen, per day	3.00
General company men, per day	3.00
Single mule drivers, per day	3.00
Engineers, per day	3.00
Weighmen, per day	2.50
Tipplemen, per day	2.25
Blacksmiths, per day	3.00
Carpenters, per day	3.00
Prices of powder and supplies for miners at the Kutz mine:	
Powder, per keg	3.10
Lamp oil, per gallon	.80
Lamp cotton, per ball	.10
Squibs, per box	.25
Deductions:	
House rent, 2 rooms, per month	6.00
House rent, 3 rooms, per month	8.00
House rent, 4 rooms, per month	10.00

BY THE COLORADO FUEL AND IRON COMPANY.

On the Cerrillos Anthracite "A" 28 mine, at Madrid, Santa Fe County, N. Mex.

Thickness of vein.....inches..	36
Mining coal, per ton of 2,400 pounds, mine run	$0.90
Driving main entry, per yard	3.00
Driving back entry, per yard	2.50
Driving crosscuts, per yard	2.00
Driving raised planes, per yard	3.00
Turning rooms	8.00
Setting rough 5-foot timbers, per set	1.00
Setting timbers over 5 feet in length, per day	2.75
Wages paid:	
Pit bosses, per month	100.00
Fire bosses, per day	3.00
Track layers, per day	2.80
Company timbermen, per day	2.75
General company men, per day, inside	2.75
Company men, underground, per day	2.75
Single mule drivers, per pay	2.75
Rope riders, per day	2.80
Boys attending to doors, per day	1.00
Stable boss, per day	2.00
Engineers, per day	3.00
Boilermen, per day	2.10
Weighmen, per day	2.75
Breaker men, per day	1.50
Boys, per day	1.00
Carpenters, per day	3.00
Prices of powder and supplies for miners at the Cerrillos Anthracite "A" 28:	
Powder, per keg	2.50
Lamp oil, per gallon	.80
Lamp cotton, per ball	.05
Squibs, per box	.25

Deductions:	
Doctors and hospital, per month	$1.00
Blacksmithing, per month	.50
House rent, 2 rooms, per month	4.00
House rent, 3 rooms, per month	6.00
House rent, 4 rooms, per month	8.00

On the Cerrillos Anthracite "B" 33 mine, at Madrid, Santa Fe County, N. Mex.

Thickness of vein.....inches..	48
Mining coal, per ton of 2,400 pounds, mine run	$0.90
Driving main entry, per yard	3.00
Driving back entry, per yard	2.50
Driving crosscuts, per yard	2.00
Driving raised planes, per yard	3.00
Turning rooms	8.00
Setting rough 5-foot timbers, per set	1.00
Setting timbers over 5 feet in length, per day	2.75
Wages paid:	
Pit bosses, per month	100.00
Fire bosses, per day	3.00
Track layers, per day	2.75
Company timbermen, per day	2.75
General company men, per day	2.75
Company men, underground, per day	2.75
Team drivers, per day	2.80
Rope riders, per day	2.80
Stable boss, per day	2.00
Engineers, per day	3.00
Boiler men, per day	2.10
Weigh men, per day	2.75
Breaker men, per day	1.50
Boys, per day	1.00
Prices of powder and supplies for miners at the anthracite mine:	
Powder, per keg	2.50
Lamp oil, per gallon	.80
Lamp cotton, per ball	.05
Squibs, per box	.25
Deductions:	
Doctors and hospital, per month	1.00
Blacksmithing, per month	.50
House rent, 2 rooms, per month	4.00
House rent, 3 rooms, per month	6.00
House rent, 4 rooms, per month	8.00

On the Cerrillos Bituminous No. 27 mine, at Madrid, Santa Fe County, N. Mex.

Thickness of vein.....feet..	3½ to 4
Mining coal, per ton of 2,400 pounds, mine run	$0.80
Driving main entry, per yard	3.00
Driving back entry, per yard	2.50
Driving crosscuts, per yard	2.00
Driving main slope when in natural coal, per yard	6.00
Driving raised planes, per yard	3.00
Turning rooms	8.00
Setting rough 5-foot timbers, per set	1.00
Setting timbers over 5 feet in length, per day	2.75
Wages paid:	
Pit bosses, per month	100.00
Fire bosses, per day	3.00
Shot firers, per day	2.75
Track layers, per day	2.80
Company timbermen, per day	2.75
General company men—	
Outside, per day	1.75
Inside, per day	2.75

Wages paid—Continued.	
Single mule drivers, per day	$2.75
Rope riders, per day	2.80
Boys attending to doors, per day	1.00
Stable boss, per day	3.00
Engineers, per day	3.00
Boiler men, per day	2.10
Weigh men, per month	75.00
Tipple men, per day	1.50
Blacksmiths, per day	3.00
Carpenters, per day	3.00
Prices of powder and supplies for miners, Cerrillos Bituminous mine:	
Powder, per keg	2.50
No lamp oil used; only safety lamps in use.	
Deductions:	
Doctors and hospital, per month	1.00
Blacksmithing, per month	.50
House rent, 2 rooms, per month	4.00
House rent, 3 rooms, per month	6.00
House rent, 4 rooms, per month	8.00

By EMMERSON & ALLAIRE.

On the Emmerson mine, at Carthage, Socorro County, N. Mex.

Thickness of vein ..... feet..	7
Mining coal, per ton of 2,400 pounds, mine run	$0.64
Wages paid:	
Foreman, per day	3.00
Helpers, per day	1.25
Pit bosses, per day	3.00
Prices of powder and supplies for miners:	
No powder used.	
Lamp oil, per gallon	.80
Lamp cotton, per ball	.05
Deductions, doctors, per month	1.00

RULES FOR THE CARE OF BOILERS, ISSUED BY THE COLORADO FUEL AND IRON COMPANY, FUEL DEPARTMENT.

CIRCULAR NO. 328.

DENVER, COLO., *April 27, 1903.*

To all superintendents:

The following instructions in regard to boilers must be rigidly adhered to:

First. Each boiler must be washed out at least once every two weeks, and oftener if considered necessary by the master mechanic or boiler inspector.

A man must go inside the boiler at washing time and see that no scale or mud is left and that the boiler is absolutely clean after being washed.

When a boiler is out for washing, the fire must be drawn out five hours before emptying boilers and the steam down to at least 30 pounds before blowing off.

Both manhole plates must be taken out and boilers washed from above the flues first and afterwards underneath the flues.

The boiler washer must know that all scale is removed and certify in writing to this fact.

The machinist, or other man designated by the superintendent, in charge of the boilers, must go into each boiler at least once a month and see that the boiler is clean, try the braces with a hammer, and see that they are all in good condition.

No boiler is to be fired up unless it is known after washing that it is clean and in good condition.

Connections that can not be examined while boiler is under steam must be looked after thoroughly and necessary repairs made while boiler is empty.

Second. After a boiler is fired up it must not be connected with the other boilers in the battery until the pressure is the same as on the other boilers. This is extremely important and must be rigidly adhered to.

Third. A record must be kept of the date on which each boiler in the battery is washed out and its condition, this record to be signed by the man in charge of the washing, and kept so that master mechanic or boiler inspector can refer to it at any time.

Fourth. Boilers must be blown off twice during each shift. The fireman coming on shift must do this the first thing, and also blow off the boilers again near the middle of the shift.

In blowing off boilers the water must be above the third gauge before blowing off, and should be blown down to the first gauge, but not below it.

Fifth. Safety valves on each boiler must be examined every shift and blown off to see that they are in proper working order.

Sixth. Fire-box doors must not be thrown open to check the draft unless under extraordinary conditions, but the draft must be regulated by closing and opening ash-pit doors as required.

Seventh. Ash-pit doors must be kept clear and in working order, so that draft can be regulated according to the steam pressure required.

In case of forced draft blower valves must be opened or closed as occasion requires, and fire doors should be kept closed under ordinary conditions.

Ash pits must be kept thoroughly cleaned out and ashes kept away from the damper doors, and where so fitted there must be kept a sufficient quantity of water in them.

Eighth. Water columns must have drip pipes draining into ash pits and must be blown out regularly, so water will show freely in water glass.

Low-water alarms must be kept in good working order at all times and steam gauges kept clean.

Water glasses must be kept in water columns and kept clean.

Gauge cocks on water columns must all be tried at least twice each shift and oftener if necessary and kept in good working order. Each fireman on coming on shift must try the gauge cocks, making sure that water is at proper level before starting to fire.

Ninth. Boiler settings must be kept dry and no water allowed to stand around them.

Care must also be taken that the plate over combustion chambers at back end does not sag down and cover top row of flues.

Tenth. When boiler is cleaned out the combustion chamber must be cleaned also, not allowing ashes to get within 2 feet of the boiler at any point.

Bridge walls and fire-box linings must be kept in good shape.

Eleventh. The feed pumps, hot-water heaters, forced draft, steam pipes, and every part of the boiler plant must be kept in first-class condition, and it must be considered that the care of the boiler plant, on which depends practically the working of the whole mine, is most important, and superintendents are expected to look carefully after this.

Twelfth. All flues must be cleaned at least once every day, and oftener if necessary. All flues must be scraped and all soot scale removed every month.

C. H. STEVENSON,
Master Mechanic.
ROBERT MCALLISTER,
Boiler Inspector.

Approved:

THOS. PATTISON,
Superintendent Fourth Division.
JOHN T. KEBLER,
General Manager.

Table showing statistics of the coal-mining industry in the Territory of New Mexico for the fiscal year ending June 30, 1903.

Name of mine.	Number of men employed underground.	Number of men employed outside.	Total number of men employed.	Number of boys employed underground.	Number of boys employed outside.	Total number of boys employed.	Number of days mine operated during fiscal year.	Total output in tons of 2,000 pounds.
Colfax County.								
Raton Coal and Coke Co.'s mines:								
Dutchman mine	216	106	322	12	8	20	280	137,838
Willow mines	290	140	430	12	10	22	180	166,476
Dawson Fuel Co.'s mines:								
Dawson mines Nos. 1, 2, and 3	300	150	450	6	4	10	286	243,579
Raton Fuel Co.'s mines:								
Climax	3	.....	3	1	.....	1	300	3,771
Sugarite	2	.....	2	.....	1	1	300	2,791
Llewellyn mine	2	.....	2	.....	1	1	300	3,000
Turner mine	2	.....	2	.....	1	1	225	1,350
Total	815	396	1,211	31	25	56	.....	558,805
Lincoln County.								
New Mexico Fuel Co.'s mines:								
Capitan mines Nos. 1 and 2	120	30	150	3	.....	3	280	96,000
Eagle Mining and Improvement Co.'s mine:								
Old Abe coal mine	4	1	5	.....	.....	.....	186	2,096
Total	124	31	155	3	.....	3	.....	98,096
McKinley County.								
American Fuel Co.'s mines:								
Weaver	260	98	358	10	11	21	300	376,707
Caledonian Coal Co.'s mines:								
Otero	35	8	43	.....	.....	.....	215	25,053
Clark Coal Co.'s mine	100	36	136	3	2	5	261	109,000
Rocky Cliff mine	30	2	32	.....	.....	.....	280	24,000
Black Diamond mine	10	2	12	.....	.....	.....	180	5,000
Casna mine	2	1	3	.....	.....	.....	60	150
Total	437	147	584	13	13	26	.....	539,910
Rio Arriba County.								
Kutz mine	15	3	18	.....	2	2	220	9,600
Rio Arriba Coal Co.'s mines:								
McBroom mine	6	2	8	.....	.....	.....	250	4,500
Monero mine	25	7	32	1	.....	1	295	25,000
Total	46	12	58	1	2	3	.....	39,100
Santa Fe County.								
Colorado Fuel and Iron Co.'s mines:								
Cerrillos Anthracite "No. 28"	40	14	54	2	13	15	294.5	35,621
Cerrillos Anthracite "B" "No. 33"	8	4	12	.....	.....	.....	305.5	9,232
Cerrillos Bituminous "No. 27"	59	20	79	5	.....	5	285.9	47,506
Total	107	38	145	7	13	20	.....	92,359
San Juan County.								
Stevens mine	2	.....	2	.....	.....	.....	230	1,100
Thomas mine	2	.....	2	1	.....	1	175	700
Total	4	.....	4	1	.....	1	.....	1,800
Socorro County.								
Carthage Coal Co.'s mines:								
Hilton mine	30	6	36	.....	.....	.....	275	20,375
Government mine	8	3	11	.....	.....	.....	200	4,000
Emerson mine	25	3	28	.....	.....	.....	135	5,085
Total	63	12	75	.....	.....	.....	.....	29,460

Table showing statistics of the coal-mining industry in the Territory of New Mexico for the fiscal year ending June 30, 1903—Continued.

Name of mine.	Number of men employed underground.	Number of men employed outside.	Total number of men employed.	Number of boys employed underground.	Number of boys employed outside.	Total number of boys employed.	Number of days mine operated during fiscal year.	Total output in tons of 2,000 pounds.
Summary of totals, by counties, as per headings at top of columns.								
Colfax County	815	396	1,211	31	25	56	.....	558,805
Lincoln County	124	31	155	3	.....	3	.....	98,096
McKinley County	437	147	584	13	13	26	.....	539,910
Rio Arriba County	46	12	58	1	2	3	.....	39,100
Santa Fe County	107	38	145	7	13	20	.....	92,359
San Juan County	4	.....	4	1	.....	1	.....	1,800
Socorro County	63	12	75	.....	.....	.....	.....	29,460
Total for Territory of New Mexico	1,596	636	2,232	56	53	109	.....	1,359,530

Name of mine.	Amount used in operating mine.	Net product.	Approximate price per ton of 2,000 pounds at the mine.	Estimated value of net product for fiscal year.	County percentage of total output of New Mexico.	Kind of coal.
Colfax County.						
Raton Coal and Coke Co.'s mines:						
Dutchman mine	5,792	132,046	$1.15	$151,852.90	.....	Bituminous, coking; screened, mine run.
Willow mines	1,361	165,115	1.15	188,882.25	.....	Do.
Dawson Fuel Co.'s mines:						
Dawson mines Nos. 1, 2, and 3.	3,600	239,979	1.20	287,974.80	.....	Do.
Raton Fuel Co.'s mines:						
Climax	.....	3,771	1.85	6,990.40	.....	Bituminous, coking; lump coal.
Sugarite	.....	2,791	1.85	5,163.35	.....	Do.
Llewellyn mine	.....	3,000	1.00	3,000.00	.....	Do.
Turner mine	.....	1,350	1.00	1,350.00	.....	Do.
Total	10,753	548,052	.....	645,213.70	.....	
Lincoln County.						
New Mexico Fuel Co.'s mines:						
Capitan mines Nos. 1 and 2.	1,000	95,000	2.00	190,000.00	.....	Bituminous, coking; screened, mine run.
Eagle Mining and Improvement Co.'s mine:						
Old Abe coal mine	.....	2,096	2.50	5,240.00	.....	Bituminous, coking; lump coal.
Total	1,000	97,096	.....	195,240.00	.....	
McKinley County.						
American Fuel Co.'s mines:						
Weaver	4,680	372,027	1.20	447,106.87	.....	Bituminous, noncoking; screened, mine run.
Caledonian Coal Co.'s mines:						
Otero	1,900	23,153	1.50	34,729.50	.....	Bituminous, noncoking; mine run and lump.
Clark Coal Co.'s mine	4,000	105,000	1.33	150,000.00	.....	Do.
Rocky Cliff mine	.....	24,000	1.35	32,400.00	.....	Do.
Black Diamond mine	.....	5,000	1.40	7,000.00	.....	Bituminous, noncoking; screened, mine run, and lump.
Casna mine	.....	150	2.00	300.00	.....	Bituminous, noncoking; lump coal.
Total	10,580	529,330	.....	671,536.37	.....	

Table showing statistics of the coal-mining industry in the Territory of New Mexico for the fiscal year ending June 30, 1903—Continued.

Name of mine.	Amount used in operating mine.	Net product.	Approximate price per ton of 2,000 pounds at the mine.	Estimated value of net product for fiscal year.	County percentage of total output of New Mexico.	Kind of coal.
Rio Arriba County.						
Kutz mine	Slack used.	9,600	$1.56	$15,000.00	.....	Bituminous, coking; mine run and lump.
Rio Arriba Coal Co.'s mines:						
McBroom mine	.....	4,500	1.55	7,000.00	.....	Do.
Monero mine	1,000	24,000	1.50	36,000.00	.....	Do.
Total	1,000	38,100	.....	58,000.00	.....	
Santa Fe County.						
Colorado Fuel and Iron Co.'s mines:						
Cerrillos Anthracite "No. 28."	7,250	28,371	2.97	84,517.65	.....	Anthracite coal; average price for various sizes, pea, nut, egg, stove, and lump.
Cerrillos Anthracite "B" "No. 33."	.....	9,232	2.31	21,392.17	.....	
Cerrillos Bituminous "No. 27."	1,769	45,737	1.63	78,564.91	.....	Bituminous, mine run and lump.
Total	9,019	83,340	.....	184,474.73	.....	
San Juan County.						
Stevens mine	.....	1,100	1.25	1,375.00	.....	Bituminous, mine run.
Thomas mine	.....	700	1.50	1,050.00	.....	Do.
Total	.....	1,800	.....	2,425.00	.....	
Socorro County.						
Carthage Coal Co.'s mines:						
Hilton mine	375	20,000	1.30	26,000.00	.....	Bituminous, coking; mine run.
Government mine	.....	4,000	1.30	5,200.00	.....	Do.
Emerson mine	.....	5,085	1.40	7,119.00	.....	Do.
Total	375	29,085	.....	38,319.00	.....	
Summary of totals, by counties, as per headings at top of columns.						
Colfax County	10,753	548,052	.....	645,213.70	40.367	
Lincoln County	1,000	97,096	.....	195,240.00	7.217	
McKinley County	10,580	529,330	.....	671,536.37	59.712	
Rio Arriba County	1,000	38,100	.....	58,000.00	2.956	
Santa Fe County	9,019	83,340	.....	184,474.73	6.793	
San Juan County	.....	1,800	.....	2,425.00	.132	
Socorro County	375	29,085	.....	38,319.00	2.159	
Total for Territory of New Mexico	32,727	1,326,803	.....	1,796,208.80	99.336	

Table showing name of mine, method of working, power used, efficiency in horsepower, and ventilation.

Name of mine.	Method of working.	Power used.	Efficiency of machinery in horsepower.	Ventilation.
Colfax County:				
Dutchman mine	Drift, double entry, room, and pillar.	Electricity and steam.	550	Exhaust fan.
Sugarite and Climax.	Drift, single entry, room, and pillar.	Horses		Furnace.
Llewellyn	do			Air shaft.
Turner	do			Do.
Dawson mines Nos. 1, 2, and 3.	Drift, double entry, room, and pillar.	Electricity	750	Do.
		Steam	260	Exhaust fans.
Willow mines	do	Electricity and steam.	600	Do.
Lincoln County:				
Capitan mines Nos. 1 and 2.	do	Steam	200	Exhaust fan.
Old Abe	Slope, single entry, room, and pillar.	Horse whim		Air shaft.
McKinley County:				
Catalpa	Slope, double entry, room, and pillar.	Steam	290	Exhaust fan.
Gallup	do	do	800	Do.
Weaver	Drift, double entry, rib, and room.	Steam for tipple and fan.	110	Do.
Thatcher	Slope, double entry, room, and pillar.	Steam	274	Do.
Otero	do	do	111	Do.
W. A. Clark mine	do	Electricity	500	Do.
Rocky Cliff	Drift, single entry, room, and pillar.	Horses		Furnace.
Union	Slope, double entry, room, and pillar.	Steam	20	Do.
Black Diamond	Drift, single entry, room, and pillar.	do	20	Air shaft.
Casna	Slope, single entry, room, and pillar.	Horses		Air shafts.
Rio Arriba County:				
Monero	do	Steam	75	Natural.
Kutz	do	do	30	Furnace.
McBroom	do	Horses		Natural.
Santa Fe County:				
Cerrillos Bituminous.	Slope and 2 back slopes, double cross entries, room, and pillar.	Steam and compressed air.	350	Exhaust fan.
Cerrillos Anthracite.	do	do	200	Do.
Anthracite "B" No. 33.	do	Compressed air	40	
Block coal mine	Slope, single entry, room, and pillar.	Horse whim		Air shaft.
Una del Gato	Slope and 2 back slopes, double cross entries, room, and pillar.	Steam	30	Do.
Socorro County:				
Carthage	Slope, single entry, room, and pillar.	do	50	Do.
Government	do	do	50	Do.
Emmerson	do	Gasoline engine	25	Do.
Total efficiency in horsepower			5,335	

Directory of New Mexico coal mines and management in charge, 1903.

Name of mine.	Name of owner.	Name of manager or superintendent.	Post-office.
Colfax County:			
Willow mines	Raton Coal and Coke Co.	J. van Houten, vice president. Wm. J. Murray, general manager.	Raton, N. Mex.
Dutchman mine		Joseph Curren, superintendent Willow mines.	Van Houten, N. Mex.
		Bert Lloyd, superintendent Dutchman mine.	Blossburg, N. Mex.
Climax mine	Raton Fuel Co	A. L Hobbs, general manager.	Raton, N. Mex.
Sugarite mine			
Llewellyn mine	Thomas Llewellyn	Thomas Llewellyn, superintendent.	Do.
Turner mine	John F. Turner	John F. Turner, superintendent.	Do.
Dawson mines, Nos. 1, 2, and 3.	Dawson Railway and Coal Co.	W. P. Thompson, general manager. Al. French, superintendent	Dawson, N. Mex.
Lincoln County:			
Capitan mines, Nos. 1 and 4.	N. Mex. Fuel Co	W. P. Thompson, general manager. James McCartney, superintendent.	Capitan, N. Mex.
Old Abe Coal mine.	Eagle Mining and Improvement Co.	John M. Rice, general manager. Arnold Ridgway, superintendent.	Whitecaks, N. Mex.
McKinley County:			
Gallup mine	American Fuel Co	John T. Kebler, general manager.	Boston building, Denver, Colo.
Weaver mine		Thomas Pattison, division superintendent.	Gallup, N. Mex.
Catalpa mine		Hugh McGinn, mine superintendent.	Gibson, N. Mex.
Clark Coal Co	Clark Coal Co	W. L. Bretherton, agent	Clarkville, N. Mex.
Otero mine	Caledonian Coal Co	Alex. Bowie, general manager.	Gallup, N. Mex.
Thatcher mine		John Stewart, superintendent.	
Rocky Cliff	Stephen Canavan	Stephen Canavan, general manager.	Do.
Union mine	Union Coal Co	Wm. McVicker, general manager.	Do.
Black Diamond mine.	Black Diamond Coal Co.	John Sharp, general manager.	Do.
Casna mine	Andrea Casna	Andrea Casna, superintendent.	Do.
Rio Arriba County:			
Monero mines, Nos. 1 and 2.	Rio Arriba Coal Co	J. H. Crist, general manager	Monero, N. Mex.
McBroom mine			
Kutz mine	Geo. W. Kutz & Co	Geo. W. Kutz, general manager.	Lumberton, N. Mex.
Santa Fe County:			
Cerrillos Bituminous.	Colorado Fuel and Iron Co.	John T. Kebler, general manager.	Boston Building, Denver, Colo.
Cerrillos Anthracite and Anthracite "B" No. 33.		James Lamb, superintendent.	Madrid, N. Mex.
Block coal mine	Estate of Leonard Lewisohn.	Richard S. McCaffrey, agent	San Pedro, N. Mex.
Pecos coal mine	J. L. Wells	J. L. Wells, superintendent	Cerrillos, N. Mex.
Una del Gato	E. B. Field, owner; New Mexico Fuel and Iron Co., operator.	W. S. Hopewell, general manager.	Santa Fe, N. Mex.
		Thomas Ramsay, superintendent.	Hagan, Sandoval County, N. Mex.
Socorro County:			
Hilton mine	Carthage Coal Co	A. H. Hilton, general manager.	San Antonio, N. Mex.
Government mine.		Robert Law, superintendent Hilton mine.	
Bernal mine		James Richardson, superintendent Government mine.	
Emmerson mine	Emmerson & Allaire	C. B. Allaire, general manager.	Do.
San Juan County:			
Thomas mine	W. H. Thomas	W. H. Thomas, superintendent.	Laplata, N. Mex.
Morgan mine	Geo. Morgan	Geo. Morgan, superintendent.	Do.
Stevens mine	E. S. Young	Thos. Evans, lessee and operator.	Fruitland, N. Mex.

List of fatal accidents in coal mines of New Mexico during the fiscal year ending June 30, 1903.

Date of accident.	Name of victim.	Name of mine.	Cause of accident.
1902			
Aug. 28	Donacio Armijo	Hilton mine, Carthage, N. Mex.	Fall of rock in room.
Sept. 8	Francisco Rosales	Weaver mine, Gibson, N. Mex.	Fall of rock in main entry.
Dec. 3	Phil Armijo	Dawson No. 1, Dawson, N. Mex.	Crushed between car and pillar of room.
5	George Crickard	do	Struck by mine car.
1903.			
Jan. 7	George Andler	Weaver mine, Gibson, N. Mex.	Fall of rock in room.
29	J. C. Starling	Capitan No. 4, Capitan, N. Mex.	Fall of rock from roof.
30	Charles Karrow	Weaver mine, Gibson, N. Mex.	Fall of sandstone rock.
Mar. 16	Giov Davito	Anthracite "A" "28" Madrid, N. Mex.	Fall of rock in room.
24	Frank Prevedal	Clark Coal Co. mine, Clarkville, N. Mex.	Fall of rock from roof of entry.
May 1	James A. Taylor	Capitan No. 1, Capitan, N. Mex.	Fell in front of mine car, being run over.
11	William Bierman	Cerrillos Bituminous, Madrid, N. Mex.	Shot exploded before he got out of entry.
25	Samuel Obannon	Hagan mine, Hagan, N. Mex.	Fall of coal.
June 19	Thos. Poyser	Blossburg No. 3, Blossburg, N. Mex.	Explosion, produced by blown out shot.
19	Joe Fresnegg	do	Do.
19	Toni Novlen	do	Do.
19	Alfonso Deme	do	Do.
19	Jack Stoln	do	Do.

RECORD OF FATAL ACCIDENTS.

COLFAX COUNTY.

Dawson Mine.

December 5, 1902.—George Crickard; age, 60 years, a carpenter; nativity, American; was injured while setting poles on the tipple for electric-light wires. He left his partner and went to the opposite side of the tipple and stood on the track to see if the pole was plumb or not, and stood there until an empty mine car, coming from the tipple, struck him, knocking him down and causing injuries which proved fatal.

December 3, 1902.—Phil Armijo; age, 35 years; nativity, Mexican; occupation, driver; was injured in mine No. 1, at Dawson, N. Mex., on the 12th day of November. He died from his injuries on the 3d day of December. Deceased was riding a pit car into room No. 5. He rode the car to the switch and got off to turn the switch after the car had passed over it, then run up the side of the car intending to get on the car again. While attempting to do so he was caught between the car and the pillar of the room, bruising his left hip.

Blossburg Mine No. 3.

June 19, 1903.—Thomas Poyser; age, 20; nativity, Scotch; occupation, miner. Joe Fresnegg; age, about 25; nativity, Slav; occupation, driver. Toni Novlen; age, 30; nativity, Slav; occupation, miner. Alfonso Deme; age, about 35; nativity, Slav. Jack Stoln; age, 38; nativity, Slav; occupation, miner. They were all killed in Blossburg mine No. 3 at about 11 p. m., on the 19th day of June, 1903. Cause of accident—blown out shot.

Copy of verdict of coroner's jury.

Territory of New Mexico,
County of Colfax, ss:

We, the coroner's jury, duly impanelled and sworn according to law to inquire into the death of Thomas Poyser, Alfonso Dome, Toni Novlen, Joe Fresnegg, and Jack Stoln, in mine No. 3, of the Raton Coal and Coke Company property at Blossburg, in Colfax County, N. Mex., find from the evidence before us that the above-named men came to their death by suffocation, as the result of an explosion in said mine on the night of the 19th day of June, 1903, and from the evidence we are unable

to definitely ascertain whether the explosion was caused by what is known as a "windy shot" or a neglected door.

(Signed) CHAS. M. BAYNE,
Justice of the Peace.
JAMES WALLACE,
THOMAS HARDIN,
ROY RHINEHART,
E. E. BUNN,
EDWARD S. THROPE,
MAT ARKLE,
Jury.

LINCOLN COUNTY.

CAPITAN NO. 4 MINE.

January 29, 1903.—J. C. Starling; age, 35 years; occupation, miner; nativity, American; was injured in Capitan mine No. 4 at about 10.30 a. m. on January 29. Cause of accident: Fall of rock from roof of slope where deceased and two other men were engaged repairing. From interview with the two men engaged at the time with deceased I am of the opinion that all three men considered the rock which fell safe until it fell, killing Starling instantly. Deceased had been with the company only five months. Nothing was known of his family.

Report of coroner's jury, precinct No. 9.

We, the undersigned, justice of the peace and jury, on this the 29th day of January, 1903, in precinct No. 9, county of Lincoln and Territory of New Mexico, having held inquest on the body of one J. C. Starling, and upon hearing the testimony in said case do hereby find that deceased met his death in No. 4 mine of New Mexico Fuel Company, of Capitan, N. Mex., County of Lincoln, on the 29th day of January, 1903, by a fall of rock through the misplaced confidence of himself and two comrades, Martin Cambetta and Frank Sherbly, in the stability of the fallen rock.

Witness our hands this 29th day of January, 1903.

(Signed) ROBERT HURT,
Justice of the Peace.
IRA O. WHETMORE,
J. L. MCBROOM,
C. M. SHELBY,
W. M. EIDSON,
JOE FALCONIO,
ANTON GEORGE,
Jury.

CAPITAN MINE NO. 1.

May 1, 1903.—James A. Taylor; age, 24 years; nativity, American; occupation, driver; was injured in mine No. 1 at North Capitan, N. Mex., at 11.30 p. m. on the 1st day of May, 1903. Deceased was found by W. W. Hass and Hugh Murry about 1.30 a. m. under the head car of a trip of two loaded cars, which he had pulled from their places. The position of the body would indicate that he had slipped from off the front car and before he could extricate himself the front wheel of car ran over his body. Apparently death was instantaneous. As no one was with him at the time the actual cause of this accident is problematical. The deceased had been instructed by the other driver to ride the rear end of trip, which he did not do.

Report of coroner's jury.

We, the undersigned jurymen, holding an inquest upon the body of James A. Taylor, find that the said James A. Taylor came to his death in No. 1 mine, operated by the New Mexico Fuel Company, North Capitan, N. Mex., in said county and Territory, on the night of May 1, 1903, by slipping or falling in front of a mine car while in motion, causing one wheel of the car to run over his body, and one hind wheel stopping upon the body of deceased, and we can state no explicit reason as to direct cause of the accident. We can not determine that anyone was responsible for this accident.

W. M. EIDSON,
Justice of the Peace.
PETER FRANK,
J. M. ANTLEY,
C. M. SHELBY,
JOE FALCONIO,
J. L. MCBROOM,
Jury.

McKINLEY COUNTY.

Weaver Mine.

September 8, 1902.—Francisco Rosales; age, 31; nativity, Mexican; occupation, coal miner; was injured in Weaver mine at Gibson, N. Mex., on the 8th day of September, 1902. He was widening out a part of main entry, preparatory for the putting in of a new side track, first taking out the coal and then taking down the loose, overhanging rock or draw slate. He and his partner were in the act of loading a car of coal out from under the loose draw rock that should have been taken down before they started loading the car. They had set up a temporary prop in an imperfect manner to hold up the rock until they loaded the car of coal. When they had the car half loaded the post swung and a part of the rock fell on top of him.

Coroner's inquest, Gibson precinct No. 2.

We, the undersigned, justice of the peace and jury, who sat upon the inquest held this 9th day of September, 1902, on the body of Francisco Rosales, found in Gibson precinct No. 2 of the county of McKinley, Territory of New Mexico, find that deceased came to his death by reason of rock falling on top of him, and there is no person to blame for the occurrence but himself.

John L. Pitts,
Justice of the Peace.
Geo. Hubbs,
S. G. Carter,
Jose L. Pacias,
Jose Dichabez,
G. Gonsalez,
Hugh McGinn,
Jury.

January 7, 1903.—George Andler; age, 27 years; nativity, Austrian; occupation, coal miner; was injured in the Weaver mine at Gibson, N. Mex., on the 2d day of January, and died, from injuries received, on the 7th day of January, 1903. He had only been with the company about three months. Cause of accident: A neglect on the part of the man himself in not safely securing his working place. His face row of props were 13 feet back from coal breast. This space allowed the roof to draw and a part of it fell down on top of him while he was undermining his coal breast. If there had been a row of props set 7 feet back from the face instead of 13 feet the roof would have been secured so that there would have been no danger.

January 30, 1903.—Charles Karrow; age, 55 years; nativity, German; occupation, coal miner; was found in the first L. air course of Weaver mine, No. 31, on the 30th day of January, 1903. He had been in the employment of the company for about two years. Nothing is known of his family. Cause of death: It is not known for certain just what time or date this man lost his life. He was an old man of peculiar habits and very hard of hearing. The mule drivers report that they hauled the last car of coal out of his room the afternoon of January 26. He lived by himself and worked at irregular intervals. He was working in what was considered a safe place. When he had been missing from his cabin for some time search was made in his working place on the evening of the 30th, and his dead body found, covered with a slab of sandstone rock.

Coroner's inquest, precinct No. 2.

We, the undersigned, justice of the peace and jury who sat upon the inquest held this 2d day of February, 1903, upon the body of Charles Karrow, found in precinct No. 2, McKinley County, Territory of New Mexico, found that deceased came to his death by fall of rock in the Weaver mine, room 31, 1st L. air course, on or about January 26, 1903. He had set a prop under this rock before firing his shot. After shooting he failed to reset his prop before starting to work under the loose rock, it falling on him and killing him. We find no person or persons responsible for his death, and we further find that he came to his death through his own neglect.

P. A. O'Neal,
Justice of the Peace.
John Howard,
O. M. Kimmy,
Robert Bolan,
Hugh McGinn,
Mat Brunkette,
L. Ohlm,
Jury.

CLARK COAL COMPANY MINE, PRECINCT NO. 1.

March 24, 1903.—Frank Prevedal; age, 45 years; nativity, Italian; occupation, miner; was injured in mine No. 1, at Clarkville, N. Mex., on the 24th day of March, 1903. Cause of accident: Deceased was in the act of commencing work after dinner when rock fell from the roof of entry as he passed under it about 50 feet from his working place. The rock fell on his right leg and rolled over his body breaking his right leg in two places. There were also internal injuries in abdomen which caused peritonitis and was direct cause of death.

Coroner's jury, precinct No. 1.

We, the undersigned, who sat upon the inquest held this 24th day of March, 1903, on the body of Frank Prevedal, found in precinct No. 1, of the county of McKinley, Territory of New Mexico, find that the deceased came to his death accidentally by a fall of rock in the mine at Clarkville, N. Mex., on the 24th day of March, 1903. We further find that the blame can not be attached to any one only himself, he alone being to blame.

T. C. DE SHON,
Justice of the Peace.

JOHN BEDDOW,
H. L. FENTON,
S. ROMERO,
JOE MANAPACE,
CHAS. STARKS,
HERMAN TECKLENBERG,
Jury.

SANTA FE COUNTY.

CERRILLOS ANTHRACITE "A" "NO. 28" MINE.

March 16, 1903.—Giov Davito; age, 35 years; nativity, Italian; occupation, miner; was injured in Cerrillos Anthracite "A" "No. 28" mine at Madrid, N. Mex., at about 3 p. m. on the 16th of March, 1903. He had been with the company about three years, was married, his family living in Italy. Cause of accident: The deceased while working in room 2, off main slope, attempted to take down a piece of loose rock at face of room with his pick and failed; he then tried it with a wedge and again failed; returning, started to dig coal under same; after working five minutes the rock fell, causing instant death.

CERRILLOS BITUMINOUS "NO. 27" MINE.

May 11, 1903.—William Bierman; age, 27 years; nativity, American; occupation, shot firer; was instantly killed in Cerrillos Bituminous "No. 27" mine at about 6 p. m. on the 11th day of May, 1903. He was unmarried, his nearest relative living at Spokane, Wash. He had been with the company four years and was an efficient man. Cause of accident: William Bierman and Thomas Blair, shot firers, went into the fourth right main entry to fire the shots. Bierman found two shots in the coal and lighted one of these and stopped to light the other one. Before he lighted the second the first went off on him.

UNA DE GATO MINE.

May 25, 1903.—Samuel Obannon; age, 31 years; nativity, Mexican; occupation, miner; was injured in mine No. 1 at Hagan, N. Mex., on the 25th day of May, 1903, dying from his injuries a few hours later. Cause of accident: Samuel Obannon was hurt by fall of coal while drilling a hole in brushing bottom. Shift boss Mr. H. Maurry warned him at seeing a small chunk of coal fall, but instead of moving forward he moved back, getting in the way of the falling coal, causing his death four hours later. The witnesses state that in their opinion the mine at that point was not considered dangerous or unsafe.

WM. W. ATCHISON,
Acting Justice of the Peace.

W. A. DUNLAVEY,
JOHN L. PITTS,
P. N. ARENDA,
H. C. THOMPSON,
J. C. ROLANDO,
AUGUSTIN ARMIJO,
Witnesses.

SOCORRO COUNTY.

HILTON MINE.

August 23, 1902.—Donacio Armijo; age, 19 years; nativity, Mexican; occupation, miner; was injured in mine No. 1, at Carthage, N. Mex., on the 16th of July, 1902, and died from effects of injuries on the 23d day of August, 1902. He had been with the company about one week, was unmarried, his people living at San Antonio, N. Mex. Cause of accident: While deceased was changing a set of timbers and not protecting the roof rock by putting up props he knocked out the timber, part of the rock falling on his leg. Some time afterwards the doctors said the leg had to come off. The operation was delayed somehow or other about two weeks, then it was taken off, but on the 23d of August he died.

There was reported to me as United States mine inspector the foregoing detailed 17 accidents during the fiscal year ending June 30, 1903. A summary of the cause to which the fatalities were attributed is as follows: By fall of rock, 8; by explosion produced by blown-out shot, 5; struck by mine cars, 3; shot firer killed by premature explosion of shot, 1. Total, 17.

County.	Tons of coal mined.	Lives lost.	Number of tons of coal mined for each life lost.
Colfax	558,805	7	79,829.2
Lincoln	98,096	2	49,048
McKinley	539,910½	4	134,977.5
Rio Arriba	39,100		
Santa Fe	92,359	3	30,786.3
San Juan	1,800		
Socorro	29,460	1	29,460
Total	1,359,530½	17	79,972.3

Total number of tons mined in New Mexico during fiscal year, 1,359,530.5; total number of lives lost during fiscal year, 17; average number of tons mined for each life lost, 79,972.35.

NONFATAL ACCIDENTS.

Ninety-four nonfatal accidents were reported to this office during the fiscal year. As I know of accidents of this degree having occurred at other mines than those reporting, and am certain that this is an incomplete list, I believe it would be an injustice to the managers of the mines where these accidents occurred to publish the list, while others would make a more creditable showing who have declined to report such accidents, and there is no specific requirement to do so in the law, hence I refrain from reporting details for publication.

NEW MINES OPENED DURING FISCAL YEAR ENDING JUNE 30, 1903.

Three new mines were opened during the year, but neither of them had commenced shipping to market prior to June 30, 1903.

The names of the mines are as follows: The Una del Gato and the Pinavitito mines, situated in Santa Fe County, and operated by the New Mexico Fuel and Iron Company—W. S. Hopewell, general manager, Santa Fe, N. Mex. The Bernal Mine, situated in Socorro County, and operated by the Carthage Coal Company—A. H. Hilton, general manager, San Antonio, Socorro County, N. Mex.

MINES RESUMED OPERATION.

Work was resumed in June upon the Gallup mine, situated at Gibson, McKinley County, N. Mex. The mine is one of the best developed, best equipped, and largest producing mines of New Mexico. Operation was suspended last year on account of lack of demand for the product. It will probably be a large producer during the ensuing year. It is owned and operated by the American Fuel Company—John T. Kebler, general manager, Denver, Colo.

Several prospect mines are reported as having found good coal seams in their workings during the past year, but have not yet sufficient development to come within the jurisdiction of the mine inspector.

MINES ABANDONED DURING FISCAL YEAR ENDING JUNE 30, 1903.

Blossburg mines Nos. 1 and 4, Colfax County, were abandoned on account of faulty condition of area into which development had recently been carried, and because there is an abundance of much thicker coal, easy of access, within the ground controlled by the company. But there is a great deal of coal of 4 feet in thickness in the vicinity of the Blossburg No. 4, and other abandoned mines of the Blossburg and Gardiner coal areas, that will some time be mined, but not until the thicker coal areas are worked out, which will probably be a century hence.

Production of coke in New Mexico for the fiscal year ending June 30, 1903.

Name of ovens.	Number of tons.	Estimated value per ton of 2,000 pounds.	Value of product at the ovens.
At the ovens of the Dawson Fuel Co., at Dawson, Colfax, County, N. Mex.[a]	18,074	$3.00	$54,222.00
At the ovens of the Raton Coal and Coke Co., Gardiner, N. Mex.[b]	8,279	2.50	20,697.50
Total	26,353		74,919.50

[a] The coal from which this coke was made was mined from the Dawson mines.
[b] The coal from which this coke was made was mined from the Willow mines, owned by the Raton Coal and Coke Company.

ANALYSIS OF NEW MEXICO COALS.

McKinley County.

Analysis of coal from Catalpa mine, near Gallup, McKinley County, N. Mex.

[Owned and operated by American Fuel Company.]

	Per cent.
Moisture	6.66
Volatile matter	40.13
Fixed carbon	45.56
Ash	7.65
Total	100.00

Analysis of coal from Weaver mine, at Gibson, near Gallup, McKinley County, N. Mex.

[Owned and operated by Colorado Fuel and Iron Company,]

	Per cent.
No. 3 seam:	
Moisture	9.13
Volatile matter	38.45
Fixed carbon	49.45
Ash	2.99
Total	100.00
No. 5 seam:	
Moisture	8.23
Volatile matter	40.61
Fixed carbon	45.17
Ash	5.99
Total	100.00

The Gallup mine is being operated upon the same coal seams as the Weaver mine, viz, No. 3 and No. 5, and analysis of coal is similar to that given above for those seams.

COLFAX COUNTY.

Analysis of coal and coke produced from Raton Coal and Coke Company's mines at Raton, Colfax County, N. Mex.

Coal from Raton Coal and Coke Company:	Per cent.
Water	0.75
Volatile matter	34.40
Fixed carbon	56.93
Mineral ash	7.92
Total	100.00
Coke	64.85
Character of coke, very strong and tough.	
Color of ash, very light ocher.	
Character of ash, soft and light.	
Sulphur (as sulphide)	.016
Sulphur (as sulphate)	.022
Phosphorus	.014
Specific gravity	1.291
One cubic foot weighs	[a] 88.690
Analysis of mineral ash:	
Silica	44.16
Alumina	39.28
Oxide of iron	2.95
Calcium oxide	7.41
Magnesium oxide	3.27
Sulphate of calcium	.41
Alkalies and loss	2.52
Total	100.00

Analysis of coal produced from Raton Coal and Coke Company's "Willow" mines at Van Houten, Colfax County, N. Mex.

	Per cent.
Moisture	3.61
Volatile matter	35.55
Fixed carbon	51.73
Sulphur	.63
Ash	8.48
Total	100.00

Analysis of coal produced from Raton Coal and Coke Company's "Dutchman" mine at Blossburg, Colfax County, N. Mex.

	Per cent.
Moisture	1.28
Volatile matter	33.90
Fixed carbon	56.68
Sulphur	.65
Ash	7.49
Total	100.00

Analysis of coal from Dawson Fuel Company's mines at Dawson, Colfax County, N. Mex.

	Per cent.
Water	1.32
Volatile matter	37.47
Fixed carbon	52.50
Sulphur	.21
Ash	8.50
Total	100.00

[a] Pounds.

SANTA FE COUNTY.

Analysis of coal from the Cerrillos Bituminous mine of the Colorado Fuel and Iron Company at Madrid, Sante Fe County, N. Mex.

[Made by W. D. Church, December 2, 1893.]

	Per cent.
Water	2.00
Volatile matter	39.00
Fixed carbon	53.76
Mineral ash	5.24
Total	100.00
Coke	59.00
Character of coke, strong and tough.	
Color of ash, light yellowish gray.	
Character of ash, soft and light.	
Sulphur (as sulphide)	.010
Sulphur (as sulphate)	.022
Phosphorus	.006
Specific gravity	1.410
One cubic foot weighs	[a] 88.135
Analysis of mineral ash:	
Silica	26.93
Alumina	32.41
Oxide of iron	3.96
Calcium oxide	24.68
Magnesium oxide	10.32
Calcium sulphate	.21
Alkalies and loss	1.49
Total	100.00

As no analysis of recent date was obtainable, the above was copied from report of former United States mine inspector.

LINCOLN COUNTY.

Analysis of coal from New Mexico Fuel Company's mines at Capitan, Lincoln County, N. Mex.

	Per cent.
Water	0.75
Volatile matter	41.25
Fixed carbon	47.00
Ash	11.00
Total	100.00
Sulphur	.735

Analysis of coke from New Mexico Fuel Company's mines.

Mr. Hills, the geologist of the Colorado Fuel and Iron Company, who examined the property, constructed a coke oven of adobe bricks and coked some of the coal from the Akers seam, which gave the following analysis:

	Per cent.
Water	1.450
Volatile matter	3.900
Fixed carbon	76.825
Ash	17.825
Total	100.000
Sulphur	.611

[a] Pounds.

SOCORRO COUNTY.

Analysis of coal from Carthage mine No. 3, Carthage Coal Company.

	Per cent.
Moisture	Trace.
Volatile matter	37.30
Fixed carbon	54.85
Ash	7.00
Sulphur	.85
Total	100.00

Analysis of coal from Emmerson mine.

[Owned and operated by Emmerson & Allaire.]

	Per cent.
Moisture	1.00
Volatile matter	39.40
Fixed carbon	53.20
Ash	6.40
Total	100.00

LAWS GOVERNING THE WORKING OF COAL MINES IN THE TERRITORIES.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That in each organized and unorganized Territory of the United States wherein are located coal mines, the aggregate annual output of which shall be in excess of one thousand tons per annum, the President shall appoint a mine inspector who shall hold office until his successor is appointed and qualified. Such inspector shall, before entering upon the discharge of his duties, give bond to the United States in the sum of two thousand dollars, conditioned for the faithful discharge of his duties.

SEC. 2. That no person shall be eligible for appointment as mine inspector under section 1 of this act who is not either a practical miner or mining engineer, and who has not been a resident for at least six months in the Territory for which he shall be appointed; and no person who shall act as land agent, manager, or agent of any mine, or as mining engineer, or be interested in operating any mine in such Territory, shall be at the same time an inspector under the provisions of this act.

SEC. 3. That it shall be the duty of the mine inspector provided for in this act to make careful and thorough inspection of each coal mine operated in such Territory, and to report at least annually upon the condition of each coal mine in said Territory with reference to the shafts, the number of shafts or slopes for ingress or egress, the character and condition of the machinery for ventilation of such mines, and the quantity of air supplied to same. Such reports shall be made to the governor of the Territory in which such mines are located and a duplicate thereof forwarded to the Secretary of the Interior, and in case of an unorganized Territory directly to the Secretary of the Interior.

SEC. 4. That in case the said mine inspector shall report that any coal mine is not properly constructed or not furnished with reasonable and proper machinery and appliances for the safety of the miners and other employes, it shall be the duty of the governor of such organized Territory, it shall be the duty of the Secretary of the Interior, to give notice to the owners or managers of said coal mine that the said mine is unsafe, and notifying them in what particular the same is unsafe, and requiring them to furnish or provide such additional machinery, slopes, entries, means of escape, ventilation, or other appliances necessary to the safety of the miners and other employes, within a period to be in said notice named, and if the same be not furnished as required in said notice, it shall be unlawful after the time fixed in such notice for the said owner or managers to operate said mine.

SEC. 5. That in all coal mines in the Territories of the United States the owners or managers shall provide at least two shafts, slopes, or other outlets separated by natural strata of not less than one hundred and fifty feet in breadth, by which shafts, slopes, or outlets, distinct means of ingress and egress shall always be available to the persons employed in said mine. And in case of the failure of any coal mine to be so provided, it shall be the duty of the mine inspector to make report of such

fact, and thereupon notice shall issue as provided in section four of this act, and with the same force and effect.

SEC. 6. That the owners or managers of every coal mine at a depth of one hundred feet or more shall provide an adequate amount of ventilation of not less than fifty-five cubic feet of pure air per second, or thirty-three hundred cubic feet per minute, for every fifty men at work in said mine, and in like proportion for a greater number, which air shall, by proper appliances or machinery, be forced through such mine to the face of each and every working place, so as to dilute and render harmless and expel therefrom the noxious or poisonous gases; and all workings shall be kept clear of standing gas.

SEC. 7. That any mine owner or manager who shall continue to operate a mine after failure to comply with the requirements of this act and after the expiration of the period named in the notice provided for in section four of this act, shall be deemed guilty of a misdemeanor and shall be fined not to exceed five hundred dollars.

SEC. 8. That in no case shall a furnace shaft be used, or for the purposes of this act be deemed an escape shaft.

SEC. 9. That escape shafts shall be constructed in compliance with the requirements of this act within six months of the date of the passage hereof, unless the time shall be extended by the mine inspector, and in no case shall said time be extended to exceed one year from the passage of this act.

SEC. 10. That a metal speaking tube from the top to the bottom of the shaft or slope shall be provided in all cases, so that conversation may be carried on through the same.

SEC. 11. That an approved safety catch be provided and sufficient cover overhead on every carriage used in lowering or hoisting persons. And the mine inspector shall examine and pass upon the adequacy and safety of all such hoisting apparatus.

SEC. 12. That no child under twelve years of age shall be employed in the underground workings of any mine. And no father or other person shall misrepresent the age of anybody so employed. Any person guilty of violating the provisions of this section shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be fined not to exceed one hundred dollars.

SEC. 13. That only experienced and competent and sober men shall be placed in charge of hoisting apparatus or engines; and the maximum number of persons who may ascend or descend upon any cage or hoisting apparatus shall be determined by the mine inspector.

SEC. 14. That it shall be lawful for any inspector to enter and inspect any coal mine in his district, and the work and machinery belonging thereto, at all reasonable times, but so as not to impede or obstruct the workings of the mine; and to make inquiry into the state of the mine, works, and machinery, and the ventilation and mode of lighting the same; and into all matters and things connected with or relating to the safety of the persons employed in or about the same; and especially to make inquiry whether the provisions of this act are complied with. And the owner or agent is hereby required to furnish means necessary for such entry, inspection, examination, and inquiry, of which the said inspector shall make an entry in the records of his office, noting the time and material circumstances of the inspection.

SEC. 15. That in all cases of fatal accidents a full report shall be made by the mine owner or manager to the mine inspector, said report to be in writing and made within ten days after such death shall have occurred.

SEC. 16. That as a cumulative remedy, in case of the failure of any owner or manager of any mine to comply with the requirements contained in the notice of the governor of such Territory or the Secretary of the Interior, given in pursuance of this act, any court of competent jurisdiction, or the judge of such court in vacation may, on the application of the mine inspector, in the name of the United States, and supported by the recommendation of the governor of said Territory or the Secretary of the Interior, issue an injunction restraining the further operation of such mine until such requirements are complied with, and in order to obtain such injunction no bond shall be required.

SEC. 17. That wherever the term "owner or manager" is used in this act, the same shall include lessees, or other persons controlling the operation of any mine. And in case of the violation of this act by any corporation, the managing officers and superintendents, and other managing agents of such corporation, shall be personally liable and shall be punished as provided in the act for owners and managers.

SEC. 18. That the mine inspectors provided for in this act shall each receive a salary of two thousand dollars per annum, and their actual travelling expenses when engaged in their duties.

SEC. 19. That whenever any organized Territory shall make or has made provision by law for the safe operation of mines within such Territory, and the governor of such Territory shall certify said fact with a copy of the said law to the Secretary of

the Interior, then and thereafter the provisions of this act shall no longer be enforced in such organized Territory, but in lieu thereof the statute of such Territory shall be operative in lieu of this act.

AN ACT To amend an act entitled "An act for the protection of the lives of miners in the Territories."

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That section six of the act entitled "An act for the protection of the lives of miners in the Territories" be amended by striking out "thirty-three hundred" and inserting "five thousand," so as to read:

SEC. 6. That the owners or managers of every coal mine shall provide an adequate amount of ventilation of not less than eighty-three and one-third cubic feet of pure air per second, or five thousand cubic feet per minute for every fifty men at work in said mine, and in like proportion for a greater number, which air shall by proper appliances or machinery be forced through such mine to the face of each and every working place, so as to dilute and render harmless and expel therefrom the noxious and poisonous gases. Wherever it is practicable to do so the entries, rooms, and all openings being operated in coal mines shall be kept well dampened with water to cause the coal dust to settle, and that when water is not obtainable at reasonable cost for this purpose accumulations of dust shall be taken out of the mine, and shall not be deposited in way places in the mine where it would be again distributed in the atmosphere by the ventilating currents: *Provided*, That all owners, lessees, operators of, or any other person having the control or management of any coal shaft, drift, slope, or pit in the Indian Territory, employing twenty or more miners to work in the same, shall employ shot firers to fire the shots therein. Said shots shall not be fired to exceed one per day—at twelve o'clock noon in cases where the miners work but half a day, and at five o'clock in the evening when the mine is working three-quarters or full time, and they shall not be fired until after all miners and other employees working in said shafts, drifts, slopes, or pits shall be out of same. The violation of this act shall constitute a misdemeanor, and any person convicted of such violation shall pay a fine of not exceeding five hundred dollars.

Approved, July 1, 1902.

DEPARTMENT RULINGS ON UNITED STATES MINE INSPECTION LAWS.

DEPARTMENT OF THE INTERIOR,
Washington, November 21, 1892.

SIR: I have the honor to acknowledge the receipt, by reference from the honorable Acting Secretary Bussey, dated the 12th instant, of a communication from the Acting Commissioner of the General Land Office, transmitting the report of Robert Forrester, mine inspector at Castlegate, Utah, relative to the condition of the Deseret Coal and Coke Company's mine, situated at Connelsville, Emery County, and leased by William Hans Carlton, of Fairview, Sanpete County, in said Territory.

The inspector reports that said Carlton employs at said mine 4 men; that the vein of coal is 11 feet thick, and that from 1,000 to 1,400 tons of coal are taken from said mine each year; that said coal is hauled out by a mule, and the mine is worked from six to nine months during the year.

The inspector further says:

"There is no escapement way provided. There is a return air way, but no air was passing through the mine when I made my examination. The connection between the air way and the working is a small aperture 20 inches square, and this is entirely too small. I would suggest that there be a furnace or other means employed to create a current of fresh air through the mine. In all other respects the mine is operated in compliance with the requirements of the Federal coal-mine laws."

In view of the foregoing the inspector requests the Acting Commissioner of the General Land Office to direct said Carlton "to provide the necessary improvements required by law, to wit:

"1. The enlargement of the return air way.

"2. The installing of some method to produce the circulation of a sufficient quantity of air for the number of miners that may be employed.

"3. The construction of an escapement way, separated from the entrance to the mine by 150 feet of natural strata."

By said reference I am requested to give an "opinion as to what action should be taken by the Department, under the act of March 3, 1891 (an act for the protection

of the lives of miners in the Territories), on the within report, and, if any, the character thereof."

The requirements of the act of March 3, 1891 (26 Stat., 1104), have been heretofore considered by the Department, and the duties of mine inspectors thereunder were prescribed in the circular dated July 12, 1892, prepared by the Acting Commissioner of the General Land Office, and approved by you (copy inclosed herewith).

In said circular, after mentioning the provisions of sections 1 and 2 of said act, it is stated:

"That it shall be the duty of the mine inspector provided for in this act to make careful and thorough inspection of each coal mine operated in such Territory, and to report at least annually upon the condition of each coal mine in said Territory with reference to the appliances for the safety of the miners, the number of air or ventilating shafts, the number of shafts or slopes for ingress or egress, the character and condition of the machinery for ventilating such mines, and the quantity of air supplied to same. Such reports shall be made to the governor of the Territory in which such mines are located and a duplicate thereof forwarded to the Secretary of the Interior, and in the case of an unorganized Territory directly to the Secretary of the Interior."

The fourth section is quoted as follows:

"That in case the said mine inspector shall report that any coal mine is not properly constructed or not furnished with reasonable and proper machinery and appliances for the safety of the miners and other employees, it shall be the duty of the governor of such organized Territory, it shall be the duty of the Secretary of the Interior to give notice to the owners or managers of said coal mine that the said mine is unsafe and notifying them in what particular the same is unsafe, and requiring them to furnish or provide such additional machinery, slopes, entries, means of escape, ventilation, or other appliances necessary to the safety of the miners and other employees within a period to be in said notice named, and if the same be not furnished as required in such notice, it shall be unlawful after the time fixed in such notice for the said owners or managers to operate said mine."

A cursory reading of said section 4 alone might indicate that both the governor and the Secretary of the Interior were required to notify the mine owners or managers in an organized Territory that their mine was unsafe, and require them within a specified time to make the necessary improvements; but when the whole act is considered, it is manifest that the notice required in said section 4 must be given by the governor of the "organized Territory," if the mine is situated therein and the law is applicable thereto, and when the Territory is unorganized the notice must be given by the Secretary of the Interior.

This view is strengthened by an examination of the sixteenth section of said act, providing "a cumulative remedy, in case of the failure of any owner or manager of any mine to comply with the requirements contained in the notice of the governor of such Territory, or the Secretary of the Interior, given in pursuance of this act," and authorizing the mine inspector to apply to "any court in vacation * * * to issue an injunction restraining the further operation of such mine until such requirements are complied with."

It may also be observed that the nineteenth section of said act makes it inoperative in any organized Territory which has made, or shall make, provision by law for the safe operation of mines therein, "and the governor of such Territory shall certify said fact, with a copy of the law, to the Secretary of the Interior."

I am informed that no certification of the governor of Utah, as required by said act, has been filed in this Department, but I find that said Territory has made provision by law for the safe operation of mines therein, by the acts of its legislature approved March 10, 1892, copies of which are inclosed herewith.

From the report of said inspector it is evident that the manager of said mine has failed to comply with section 5 of said act of March 3, 1891, and since Utah is an organized Territory I am of the opinion, and so advise you, that a copy of said report should be sent to the governor of Utah for proper action thereon, and he should also be furnished with a copy of said circular, and his attention specially called to section 19 of said act, in order that he may, if he so desires, make the certificate required therein.

The papers submitted are herewith returned.

Very respectfully,

GEO. H. SHIELDS,
Assistant Attorney-General.

The SECRETARY OF THE INTERIOR.

DEPARTMENT OF THE INTERIOR,
ASSISTANT ATTORNEY-GENERAL'S OFFICE,
Washington, March 2, 1893.

SIR: I have the honor to acknowledge the receipt, through your reference of January 17, of certain correspondence with the governors of the Territories of Utah and New Mexico relative to the act of Congress approved March 3, 1891 (26 Stat., 1104), entitled "An act for the protection of the lives of miners in the Territories," in which my attention is invited thereto for my opinion "as to whether the laws of Utah and New Mexico make such provision for the safe operation of mines within said Territories as is contemplated by the act of March 3, 1891, and would warrant the governors in certifying the same to the Secretary of the Interior in the manner prescribed by section 19 of said act; and if so, what action, if any, should be taken by the Department in the premises."

The inspector appointed under the act of 1891, Mr. Robert Forrester, in his report relative to the condition of the Deseret Coal and Coke Company's mine, situated at Connelsville, Utah, recommended that the owner of said mine be required to make certain specified improvements.

Upon said report a question arose as to who should give the notice to the owner, the Secretary of the Interior or the governor of the Territory.

In my opinion of November 21, 1892, I held that, being an organized Territory, the required notice should be given by the governor; but, as the act might be inoperative in the Territory under section 19 of the act, I was under the opinion, and so advised you, that "a copy of said report should be sent to the governor of Utah for proper action thereon, and he should be furnished with a copy of said circular, and his attention specially called to section 19 of said act in order that he may, if he so desires, make the certificate required therein."

Acting thereunder, a letter was addressed to the governor of Utah on December 9, 1892, in which his attention was invited to the nineteenth section of the act of March 3, 1891 (supra).

Under date of December 19, 1892, the governor replied "that the law of Utah was not understood to be a substitute for or to cover the subjects referred to in the act of Congress." He then goes on to show that the act of the legislature of Utah does not cover all mines; that it provides only for escapement shafts, and recognizes the existence and continued performance of the duties of the mine inspector appointed under the act of Congress.

This would seem to show conclusively that the Territory did not desire to supersede the act of Congress in this matter by the legislature referred to.

From the language of the reference, some doubt must have existed as to whether you can overrule the action of the governor, or, in other words, review the laws of the Territory and determine whether the laws of the Territory do supersede the act of Congress, and if so found, what action should be taken.

In my opinion, the only purpose of the nineteenth section of the act was to provide a way by which the Territory might supersede the act of Congress.

Under this section this could only be done by the governor certifying that the legislature has made due provision by law for the safe operation of the mines in its own territory. Of this matter the Territory is its own judge, and until such fact is certified to the Secretary of the Interior by the governor, accompanied by a copy of the law or laws on the subject, the act of Congress will remain operative.

In the present case, acting upon the report of Mr. Forrester, the governor having been furnished with a copy of the report, the duties of this department are at an end. Under the fourth section of the act, it becomes the duty of the governor to notify the owner of the mine in what particular the same is unsafe, and to require that the same be remedied within a time to be fixed by him.

Herewith are returned the papers referred by you.

Very respectfully,

GEO. H. SHIELDS,
Assistant Attorney-General.

THE SECRETARY OF THE INTERIOR.

DEPARTMENT OF THE INTERIOR,
ASSISTANT ATTORNEY-GENERAL'S OFFICE,
Washington, April 6, 1893.

SIR: I am in receipt, through reference of April 1, 1893, of letter from John C. Spears, inspector of mines for the Territory of New Mexico, for an opinion as to the proper construction of section 6 of the act of March 3, 1891 (26 Stat., 1104), entitled

"An act for the protection of the lives of miners in the Territories." Said section provides—

"That the owners or managers of every coal mine at a depth of 100 feet or more shall provide an adequate amount of ventilation of not less than 55 cubic feet of pure air per second, or 3,300 cubic feet per minute, for every 50 men at work in said mine, and in like proportion for a greater number, which air shall by proper appliances or machinery be forced through such mine to the face of each and every working place, so as to dilute and render harmless and expel therefrom the noxious or poisonous gases; and all workings shall be kept clear of standing gas."

From the letter referred, it appears that a difference of opinion exists between the mine inspector and the owners of mines in said Territory as to the proper construction of the expression "Every coal mine at a depth of 100 feet or more." This expression clearly limits the operation of the section, and it becomes necessary to determine how the measurement shall be made.

The mine owners claim that this refers to the perpendicular measurement—that is, it means 100 feet of surface by perpendicular measurement—while the mine inspector is of the opinion that it refers to the distance from the surface following the drift, slope, or shaft of the mine.

From a review of the matter, I am of the opinion that the construction placed upon the section by the mine inspector is the proper one.

This section provides for an adequate amount of ventilation, and it would seem that the length of the shaft or slope would be the basis of the determination when considering the necessity for proper ventilation, and not the distance to the face of the workings by perpendicular measurement. The distance from the surface by the slope may be 3,000 feet or more and by the perpendicular measurement the same may be less than 100 feet. If the perpendicular measurement was the criterion, this act would have no application, and as the act is for the protection of the lives of miners, it would seem that a mine with a slope of 3,000 feet or more should be properly ventilated for the protection of the lives of the miners therein employed.

I can see no good reason why the ventilation should be measured by the perpendicular measurement, and am therefore of the opinion, as before expressed, that the length of the shaft or slope is the criterion in the matter of determining the operation of this section.

Attached hereto is the letter referred.

Very respectfully,

GEO. H. SHIELDS,
Assistant Attorney-General.

The SECRETARY OF THE INTERIOR.

DEPARTMENT OF THE INTERIOR,
OFFICE OF THE ASSISTANT ATTORNEY-GENERAL,
Washington, May 9, 1893.

SIR: On the 1st instant the Acting Secretary, Hon. George Chandler, asked for my opinion as to the proper construction of sections 5 and 9 of the act of Congress for the protection of the lives of miners in the Territories, approved March 3, 1891. The exact question touching which he asks my opinion in the construction of the aforesaid sections of the act of 1891 is presented by a letter addressed to Hon. George Chandler, Acting Secretary of the Interior, by Luke W. Bryan, mine inspector for the Indian Territory, dated April 13, 1893, in which he reports that sections 5 and 9 of said act have not been complied with by several mining companies therein named in respect to the erection of shafts, slopes, and outlets, and he propounds the following question: "Will you kindly advise me whether they (meaning the owners and managers of mines) are entitled to any time beyond that prescribed in the act aforesaid for the erection of shafts, slopes, or outlets as means of escape from coal mines?"

Section 5 of said act is as follows:

"That in all coal mines in the Territories of the United States the owners or managers shall provide at least two shafts, slopes, or other outlets, separated by natural strata of not less than 150 feet in breadth, by which shafts, slopes, or other outlets, distinct means of ingress or egress shall always be available to the persons employed in said mine. And in case of the failure of any coal mine to be so provided, it shall be the duty of the mine inspector to make report of such fact, and thereupon notice shall issue, as provided in section 4 of this act, and with the same force and effect."

This section prescribes the duty imposed upon the owners or managers of coal mines as to the erection of means of escape from coal mines for the benefit of miners, and it also prescribes the distance that such shafts, slopes, or outlets shall be separated one from the other.

Section 9 is as follows:

"That escape shafts shall be constructed in compliance with the requirements of this act within six months from the date of the passage hereof, unless the time shall be extended by the mine inspector; and in no case shall said time be extended to exceed one year from the passage of this act."

It will be seen that section 9, just quoted, requires that the escape shafts provided for in section 5 shall be constructed in compliance with the requirements of the act of 1891, within six months from the date of its passage, and if not constructed within that time the mine inspector may give such reasonable time as in his judgment is proper, but in no case to extend beyond one year from the date of the passage of this act. This act was approved March 3, 1891. It is therefore apparent that the mine inspector can not extend to the owners or managers of mines any further time in which to comply with section 5 of said act of 1891. The latter clause of section 5 reads as follows: "And in case of the failure of any coal mine to be so provided it shall be the duty of the mine inspector to make report of such fact, and thereupon notice shall issue, as provided in section 4 of this act, and with the same force and effect."

Section 4 of the act provides that the mine inspector shall report to the Secretary of the Interior any failure on the part of any owners or managers of any mines to comply with the requirements of said act of 1891, and when such report is received by the Secretary of the Interior he shall give notice to such owners or managers, informing them in what respect they have failed to comply with the act of Congress aforesaid, and direct that they furnish or provide such shafts, entries, or means of escape as are required by said act, within a period to be prescribed by him in said notice; and if such shafts, outlets, or means of escape are not provided as required by such notice, then it shall be unlawful, after the time fixed in the notice, for such owners or managers to operate such mine. In my opinion, it is very clear that the mine inspector has no power or authority over the subject except to report the failure on the part of any owners or managers of coal mines to comply with the requirements of said act; and the Secretary of the Interior alone can prescribe the additional time which he deems proper within which the law can be complied with in a notice served upon the owners or managers of mines, as hereinbefore stated.

The report of the mine inspector is that certain mining companies therein named have failed to comply with the law in respect to the distance given between the escape shafts erected by them and the main shafts in the respective mines, and it is in this respect that the owners or managers of said mines are delinquent.

I am of the opinion that this report of Inspector Bryan furnishes sufficient data upon which the Secretary of the Interior can act and serve notice upon the delinquent owners or managers of the coal mines therein named, as is provided in section 4 of said act of March 3, 1891.

The papers submitted are herewith returned.

Very respectfully,

JOHN I. HALL,
Assistant Attorney-General.

The SECRETARY OF THE INTERIOR.

DEPARTMENT OF THE INTERIOR,
ASSISTANT ATTORNEY-GENERAL'S OFFICE,
Washington, June 13, 1893.

SIR: I am in receipt of a letter, dated June 5, 1893, from Robert Forrester, inspector of mines for Utah, inclosing a communication dated May 23, 1893, addressed to him by Mr. F. A. Mitchell, relative to the act of Congress of March 3, 1891 (26 Stat., 1105), entitled "An act for the protection of the lives of miners." Said letter and communication you have submitted to me for an opinion upon the points referred to therein.

The tenth section of said act requires "That a metal speaking tube from the top to the bottom of the shaft or slope shall be provided in all cases, so that conversation may be carried on through the same;" and the questions upon which an opinion is asked are:

(1) Is this section applicable to slopes through which no one is allowed to travel while the trips are running?

(2) Can a telephone or electric-bell system be substituted for the metal speaking tube required by law?

It seems to me language of said section is so clear and unambiguous that there is no room for any other construction than that indicated by the plain letter of the law, which in specific terms provides that the means of communicating from the top to the bottom of the shaft or slope must be by conversation through "a metal speaking

tube," even though other means of communication may be superior thereto; and this section would be equally applicable to all slopes, whether anyone is allowed to travel while the trips are running or not.

Very respectfully,

JOHN I. HALL,
Assistant Attorney-General.

The FIRST ASSISTANT SECRETARY OF THE INTERIOR.

AN ACT To amend an act entitled "An act for the protection of the lives of miners in the Territories."

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That section six of the act entitled "An act for the protection of the lives of miners in the Territories" be amended by striking out "thirty-three hundred" and inserting "five thousand," so as to read:

SEC. 6. That the owners or managers of every coal mine shall provide an adequate amount of ventilation of not less than eighty-three and one-third cubic feet of pure air per second, or five thousand cubic feet per minute, for every fifty men at work in said mine, and in like proportion for a greater number, which air shall by proper appliances or machinery be forced through such mine to the face of each and every working place, so as to dilute and render harmless and expel therefrom the noxious or poisonous gases. Wherever it is practicable to do so, the entries, rooms, and all openings being operated in coal mines shall be kept well dampened with water, to cause the coal dust to settle, and that, when water is not obtainable at reasonable cost for this purpose, accumulations of dust shall be taken out of the mine, and shall not be deposited in way places in the mine where it would be again distributed in the atmosphere by the ventilating currents: *Provided*, That all owners, lessees, operators of, or any other person having the control or management of any coal shaft, drift, slope, or pit in the Indian Territory, employing twenty or more miners to work in the same, shall employ shot firers to fire the shots therein. Said shots shall not be fired to exceed one per day—at twelve o'clock noon in cases where the miners work but half a day, and at five o'clock in the evening when the mine is working three-quarters of full time—and they shall not be fired until after all miners and other employees working in said shafts, drifts, slopes, or pits shall be out of same. The violation of this act shall constitute a misdemeanor, and any person convicted of such violation shall pay a fine of not exceeding five hundred dollars.

Approved, July 1, 1902.

DEPARTMENT OF THE INTERIOR,
OFFICE OF THE ASSISTANT ATTORNEY-GENERAL,
Washington, October 9, 1902.

SIR: The act of July 1, 1902 (Public, No. 222), amended section 6 of the act of March 3, 1901 (26 Stat., 1104), entitled "An act for the protection of the lives of miners in the Territories," and added thereto the following:

"* * * *Provided*, That all owners, lessees, operators of, or any other person having the control or management of any coal shaft, drift, slope, or pit in the Indian Territory, employing twenty or more miners to work in the same, shall employ shot firers to fire the shots therein. Said shots shall not be fired to exceed one per day; at twelve o'clock noon in some cases where the miners work but half a day, and at five o'clock in the evening when the mine is working three-quarters or full time, and they shall not be fired until after all miners and other employees working in said shafts, drifts, slopes, or pits shall be out of same. The violation of this act shall constitute a misdemeanor, and any person convicted of such violation shall pay a fine of not exceeding five hundred dollars."

By your reference, I am asked for an opinion as to the meaning of the clause in this proviso, to wit: "Said shots shall not be fired to exceed one per day."

Shot firing in coal mines consists in exploding powder or other substance in such way as to loosen the coal and thereby expedite its removal from the mine. By reference to the annual report of the mine inspector for the Indian Territory to the Secretary of the Interior for the year ending June 30, 1901, it appears that this shot firing is a dangerous proceeding, and that some of the companies doing a mining business in said Territory have rules in force which do not permit the firing of shots until the working day is over and the miners have left the mines. It is shown by said report, on the other hand, that some of these operators do not employ shot firers at all, the shots being fired indiscriminately by the miners themselves. This is evidently a

dangerous practice, sometimes causing explosions resulting in loss of life, and is the mischief which the statute was designed to correct. But unless the danger from firing shots in mines were so great as to warrant its prohibition altogether, it would be absurd to limit it to one shot per day. Such limitation would in many cases amount to a practical inhibition against operating the mines. A special report on this matter by a mine inspector for the Indian Territory, July 24, 1902, shows that in some of the larger mines in the Indian Territory the production is from 500 to 1,000 tons per day, and that in such mines it is necessary to fire from 200 to 300 shots per day, and that to restrict such a mine as this to one shot per day would limit the production of the mine to two or three tons per day.

Viewing the statute in the light of these considerations, I am of the opinion that it was not the intention of Congress to limit shot firing in these mines to one shot per day, but rather to limit or restrict this firing to one stated or fixed time in each day, that is, "at 12 o'clock noon in cases where the miners work but half a day, and at 5 o'clock in the evening when the mine is working three-quarters or full time," and even then not until "after all miners and other employees working in said shafts, drifts, slopes, or pits shall be out of same." To give to the act the effect evidently intended by Congress the phrase "one per day" should be read "once per day." The danger to the miners does not lie in the number of shots fired, but in the time when they are fired; and if fired at a fixed and generally understood time after the working day is over and after all miners and other employees are out of the mine, it is not a matter of public concern how many shots are fired in the work of facilitating the removal of coal therefrom.

Very respctfully,

WILLIS VAN DEVANTER,
Assistant Attorney-General.

Approved, October 9, 1902.

THOS. RYAN, *Acting Secretary.*

The SECRETARY OF THE INTERIOR.

RECOMMENDATIONS.

I have heretofore recommended and again urge that the United States law "for the protection of the lives of the miners in the Territories" be amended to render all persons employed about a coal mine amenable to the law and liable to prosecution for the breach of its provisions. Again I would call attention to this matter. A large majority of the accidents in coal mines is due to the gross negligence of the miner himself—negligence bred from constant familiarity with dangers incident to his vocation.

The operator is bound by the law to furnish every reasonable protection to his employee by maintaining proper conditions in and about the mine, and it is the duty of the mine inspector to see that these conditions are maintained, and, if the law be not complied with, to prosecute the operator and bring suit for injunction to suspend operation of the mine.

But the employee enjoys immunity from punishment for violation of the law. He may by his gross carelessness or negligence endanger the life or person of his fellow-workmen or his own with impunity, the only recourse being the suspension of operation of his working place, and at most his discharge. In the intervals between the mine inspector's visits, or between the daily inspections of the pit boss, the delinquent miner may maintain a dangerous condition in his working place; but if restrained by the wholesome knowledge that he was amenable to the law for its violation, it is hardly probable that he would act in such wanton manner as now when free of such restraint.

A majority of the fatal accidents which have occurred during my incumbency in the office were the result of carelessness on the part of the victims or their fellow-employees.

The principal object to which the mine inspector should give his attention is not the careful investigation of accidents which have occurred, but he should give his prime effort to the prevention of accidents. It is therefore not with a desire to enforce the law by prosecution of the derelict miner that I urge the recommendation for this amendment, but from the earnest belief that the restraining influence exerted by this proposed amendment of the law would cause the miner to be more careful, and thus eliminate a large percentage of the danger from his necessarily hazardous vocation.

I would again recommend that a commission, composed of experts in the art of explosives, be appointed for the purpose of experimenting and producing a flameless

explosive for use in coal mines, an explosive which could be manufactured at reasonable cost and which would be safe and convenient to use.

The recent experiences with dust explosions in the mines of the Southern and Western States, as well as in the Territories, have shown that the prevention of these terrible accidents deserves the attention of the Federal Government.

Believing that the use of flameless explosives would prevent dust explosions, I therefore offer the foregoing recommendations for the appointment of a commission for the purpose stated.

It is also recommended that restrictions be placed upon the practice which now generally obtains throughout the Territory of "shooting off the solid," otherwise blasting coal without cutting or undermining, to give a line of vantage or weakness for the shot to break to.

Shooting off the solid is the cause of the majority of blown-out shots, and these shots are responsible for the resultant dust explosions.

It is true that there are some coal seams so small that there is little opportunity for coal cutting or undermining, and in these mines there should be a close inspection of all holes drilled by the pit boss or other trustworthy official before the holes are loaded or fired, and all holes which are too strong should be condemned and the miner forbidden to shoot them.

But in the majority of mines there is ample room for cutting or mining the coal, yet but little such mining is done. Nor would proper preparation of his face or heading be a hindrance or hardship to the miner. He would break much more coal with each shot, where his coal was properly mined or cut; thus he would get full value out of the powder used, as well as from labor expended upon drilling his hole, a large percentage of both of which are lost when shooting off the solid.

Again, the danger from falling top is lessened, because where coal is cut or undermined the timbers and props can be set up close to the face of the working, without being knocked out each time a shot is fired, as happens when shooting off the solid, the force of the shot being projected out into the room or entry instead of toward the floor or side, as it would be if the coal were cut or undermined. Because the miner knocks out his props with these strong solid shots he is loath to set props up close to the face of his working, and risks his life under dangerous top, from the falling of which a majority of fatal accidents in coal mines occur.

Thus it will be seen that the pernicious practice of shooting off the solid is responsible not only for a great many dust explosions and consequent loss of life, but to this cause is also attributable much of the lax method of timbering and resulting accidents to the miners who dig coal in this manner. It may be said that many of the men now employed in coal mining do not understand how to properly make a cutting or mining. Then all the more reason to insist upon learning how and why it should be done, as the man who is so little experienced in coal cutting is surely not to be trusted to judge of the proper strength of a hole, nor with the use of explosives.

I would also recommend that section 10 of the United States law, governing the operation of coal mines in the Territories, and which is here recited ("Sec. 10. That a metal speaking-tube from the top to the bottom of the shaft or slope shall be provided in all cases, so that conversation may be carried on through the same"), be amended by inserting after the word "tube," on the first line, the following words: "or a telephone line," leaving it optional with the operator to provide either method of communication.

In connection therewith the following opinion was rendered by the Assistant Attorney-General, Hon. John I. Hall, in June, 1893, and ruling of the Department has been in accordance with the subjoined written opinion:

DEPARTMENT OF THE INTERIOR,
ASSISTANT ATTORNEY-GENERAL'S OFFICE,
Washington, June 13, 1893.

SIR: I am in receipt of a letter, dated June 5, 1893, from Robert Forrester, inspector of mines for Utah, inclosing a communication, dated May 23, 1893, addressed to him by Mr. F. A. Mitchell, relative to the act of Congress of March 3, 1891 (26 Stat., 1105), entitled "An act for the protection of the lives of miners." Said letter and communication you have submitted to me for an opinion upon the points referred to therein.

The tenth section of said act requires "That a metal speaking-tube from the top to the bottom of the shaft or slope shall be provided in all cases, so that conversation may be carried on through the same;" and the questions upon which an opinion is asked are:

(1) Is this section applicable to slopes through which no one is allowed to travel while the trips are running?

(2) Can a telephone or electric-bell system be substituted for the metal speaking-tube required by law?

It seems to me that the language of said section is so clear and unambiguous that there is no room for any other construction than that indicated by the plain letter of the law, which in specific terms provides that the means of communicating from the top to the bottom of the shaft or slope must be by conversation through "a metal speaking-tube," even though other means of communication may be superior thereto, and this section would be equally applicable to all slopes whether anyone is allowed to travel while the trips are running or not.

Very respectfully,

JOHN I. HALL,
Assistant Attorney-General.

The FIRST ASSISTANT SECRETARY OF THE INTERIOR.

While the opinion of an eminent attorney can not be gainsaid by the mine inspector, yet it is clearly apparent that what was contemplated and intended by the makers of the law was the establishment of a good and sufficient means of communication between the bottom of the mine and the pit mouth.

As the telephone is a much better means of communication and less liable to be broken, as well as easier and more quickly repaired, it would seem wrong that the absurdity of excluding the better system of communication should be allowed to remain as the law and the ruling thereunder.

It is therefore respectfully recommended that the United States laws governing the operation of coal mines be amended in these particulars.

UNITED STATES COURT OF PRIVATE LAND CLAIMS.

IRENEO L. CHAVES, *Clerk.*

List of cases in New Mexico district decided by the Court of Private Land Claims from June 30, 1902 (the date of my last report to the governor of New Mexico), to June 30, 1903.

Private land claim number.	Name of grant.	Claimed.	Rejected.
		Acres.	*Acres.*
280	Sanchez land grant	4,428	4,428
281	Barela land grant	4,428	4,428
282	Galban grant	30,000	30,000
	Total	38,856	38,856

SCHEDULE No. 2.—*Grant surveys approved in New Mexico district during the same period.*

Private land claim number.	Name of grant.	Area in survey.
		Acres.
16	Gijosa	16,240.64
107	Canyon de Chama	1,422.62
130–182	Ojo de San Jose	4,336.91
134–184 185	Pueblo of Santo Domingo and Pueblo of San Felipe	1,070.688
187	Santo Tomas de Yturbide	9,432.94
194	Santa Cruz	4,567.60
211	Santo Domingo de Cundiyo	2,137.08
264	Bartolome Sanchez	4,469.828
278	Lo de Padilla	51,940.82
	Total	95,619.126

Cases on New Mexico district not finally disposed of; also status of each case.

A.

Under advisement by the court.

Private land claim number.	Name of grant.	Remarks.
57	Nicolas Duran de Chaves...	This claim is for $513.62, for money judgment against the United States, under section 14 of the land court act, for 410 acres of land sold by the United States within the grant as confirmed.

B.

Pending on survey.

Private land claim number.	Name of grant.	Estimated area.
		Acres.
25	San Miguel del Vado	3,539
150–193	Refugio Colony	15,000
168	Santa Teresa	4,500
	Total	23,039

Recapitulation.

Cases pending under advisement, 1 (money judgment); cases pending on survey, 3 (23,039 acres).

THE PUBLIC LANDS OF NEW MEXICO.

During the fiscal year ended June 30, 1903, there were entered under the Federal land laws 1,082,128 acres of the public domain in New Mexico, an area exceeding that of the State of Rhode Island and almost equaling that of the State of Delaware. Of this area 468,196 acres were taken up under the homestead act, representing over 3,000 entries. Under the desert-land act 74,585 acres were taken up; under lieu selections, 377,596 acres; under the mineral-land act, 2,408 acres; under commutation, 3,556 acres; while the Territorial selections amounted to 167,008 acres. The Roswell land district leads with 635,319 acres taken up; the Clayton district is second, with 262,498 acres; the Santa Fe district third, with 120,822 acres, while the Las Cruces district is last, with 63,489 acres. About 52,000,000 acres are still subject to Federal land entry.

As to homestead lands taken up, Roosevelt County leads with 86,642 acres, Chaves coming second with 67,749, and Eddy third, with 49,511. Then come the other counties as follows: Union, 47,038; Quay, 42,703; Colfax, 28,806; Otero, 18,258; Mora, 17,905; Lincoln, 15,445; Grant, 15,150; San Miguel, 15,145; Leonard Wood, 15,060; Socorro, 10,819; Valencia, 9,171; Santa Fe, 5,598; Sierra, 4,909; Doña Ana, 4,690; Rio Arriba, 4,282; Bernalillo, 3,671; Luna, 2,400; San Juan, 1,960; McKinley, 1,036; Taos, 320; Sandoval, 308.

Leonard Wood lies in three land districts, those of Clayton, Santa Fe, and Roswell. The following counties lie in two land districts: Colfax, Mora, and San Miguel in the Clayton and Santa Fe districts; Roosevelt in the Clayton and Roswell districts; Socorro in the Santa Fe and Las Cruces districts; Valencia in the Santa Fe and Roswell districts; Otero in the Las Cruces and Roswell districts. Of the other counties Union and Quay are in the Clayton district; Bernalillo, McKinley, Rio Arriba, Sandoval, San Juan, Santa Fe, and Taos in the Santa Fe district; Doña Ana, Sierra, Luna, and Grant in the Las Cruces district; Chaves, Eddy, and Lincoln in the Roswell district.

Although the land entries during the last fiscal year amounted to over a million acres, yet almost 50,000,000 acres of the public domain in New Mexico still remain open to entry. Nevertheless, the time is measurably distant when the splendid public domain will have passed into private ownership or be included in forest or other reserves.

If the present rate of the segregation of the public domain is kept up it will be less than fifty years before New Mexico must put up the sign, "No more free homesteads."

FEDERAL LAND OFFICES.

Abstract of business transacted at the United States land office at Santa Fe for the fiscal year ending June 30, 1903.

[M. R. Otero, register; Fred. Muller, receiver.]

County.	Homesteads.	Mineral lands.	Desert lands.	Land sold.	Lieu selections, act of June 4, 1897.	Territorial selections, act of June 21, 1898.	Total.
	Acres.	*Acres.*	*Acres.*	*Acres.*	*Acres.*	*Acres.*	*Acres.*
Bernalillo	3,671.00	.....	.....	.....	160.00	.....	3,831.00
Colfax	7,844.00	.....	601.67	69.62	2,438.20	12,550.78	23,504.27
Leonard Wood	8,972.45	.....	240.00	.....	80.00	.....	9,294.45
McKinley	1,036.00	.....	.....	.....	240.00	.....	1,276.00
Mora	11,134.00	.....	939.92	.....	1,840.81	9,657.65	13,572.38
Rio Arriba	4,281.79	217.00	.....	.....	.....	.....	4,498.79
Sandoval	308.00	38.00	.....	1,998.64	133.44	.....	2,477.08
San Juan	1,960.00	.....	80.00	.....	.....	.....	2,040.00
San Miguel	12,208.31	.....	.....	40.00	300.00	.....	12,548.31
Santa Fe	5,697.86	101.00	.....	.....	160.00	.....	5,858.86
Socorro	1,961.00	.....	.....	.....	.....	.....	1,961.00
Taos	320.00	283.70	.....	.....	.....	29,985.57	30,589.27
Valencia	9,170.58	.....	1,220.00	.....	200.00	.....	10,590.58

Total number of acres disposed of during fiscal year, 120,821.99.
Amount of fees and commissions received therefrom, $66,461.25.

Abstract of business transacted at the United States land office at Las Cruces.

[Nicholas Galles, register; H. D. Bowman, receiver.]

DOÑA ANA COUNTY.

	Number.	Acres.
Homestead applications	28	3,585
Final homestead entries	7	1,105
Lieu selections, act June 4, 1897	7	560
Total acres entered		5,250

OTERO COUNTY.

Homestead applications	79	11,740
Lieu selections act, June 4, 1897	2	240
Final homestead entries	26	3,688
Original desert-land entries	28	3,914
Final desert land	2	160
Cash entries	9	787
Total		20,529

Total acreage in Lincoln Forest Reserve created during year, 64,845.

SIERRA COUNTY.

Homestead applications	37	4,340
Final homestead entries	6	569
Original desert-land entries	2	80
Mineral applications	3	80
Mineral entries	5	120
Total acres entered		5,189

LUNA COUNTY.

Homestead applications	12	1,800
Lieu selections under act June 4, 1897	4	354
Final homesteads	5	760
Desert land, original	1	80
Total number of acres entered		2,994

GRANT COUNTY.

Homestead applications	83	12,407
Lieu selections, act June 4, 1897	6	280
Final homestead entries	22	2,743
Original desert-land entries	2	480
Final desert-land entry	1	320
Cash entries	12	661
Mineral applications	7	412
Mineral entries	18	728
Total number of acres entered during the fiscal year 1902		18,031

SOCORRO COUNTY.

Homestead applications	47	6,658
Final homesteads	17	2,200
Lieu selections under act June 4, 1897	21	2,280
Coal entry	1	438
Total number of acres entered during fiscal year 1902		11,576

Abstract of business transacted at the United States land office at Clayton.

[Edward W. Fox, register; A. W. Thompson, receiver.]

County.	Homesteads.	Lieu selections.	Desert-land entries.	Total.
	Acres.	*Acres.*	*Acres.*	*Acres.*
Colfax	20,962	14,939	160	36,061
Union	47,038	95,696	4,715	147,449
Mora	6,771	1,002	220	8,093
San Miguel	2,397	80	.....	2,477
Quay	42,708	960	599	44,262
Roosevelt	16,769	280	545	17,594
Leonard Wood	6,086	476	.....	6,562
Total	142,726	113,433	6,339	262,498

Abstract of business transacted at the United States land office at Roswell, N. Mex.

[Howard Leland, register; David L. Geyer, receiver.]

County.	Area unappropriated and unreserved.			Area reserved.	Total area appropriated.
	Surveyed.	Unsurveyed.	Total.		
	Acres.	*Acres.*	*Acres.*	*Acres.*	*Acres.*
Chaves	3,334,433	2,016,673	5,351,106	3,280	919,214
Eddy	1,634,706	2,252,741	3,887,447	6,300	426,253
Leonard Wood	52,992	.....	52,992	.....	1,280
Lincoln	2,099,041	110,670	2,209,711	463,640	502,649
Otero	48,490	1,377,549	1,426,039	208,440	17,521
Roosevelt	932,264	103,680	1,035,944	.....	219,456
Valencia	99,138	.....	99,138	.....	12,800
Total	8,201,064	5,861,313	14,062,377	681,660	2,099,173

County.	Total area in land district.	Area entered as homesteads.	Area entered under desert act.	Area entered as lieu-land selections.	Area entered, Territorial selections.
	Acres.	*Acres.*	*Acres.*	*Acres.*	*Acres.*
Chaves	6,273,600	67,749	21,990	226,210	38,182
Eddy	4,320,000	49,511	35,583	3,959	58,387
Leonard Wood	54,272	.....	.....	.....	.....
Lincoln	3,176,000	15,445	360	200	18,245
Otero	1,652,000	2,830	.....	.....	.....
Roosevelt	1,255,400	69,873	2,267	24,528	.....
Valencia	111,938	.....	.....	.....	.....
Total	16,843,210	205,408	60,200	254,897	114,814

REPORT OF THE UNITED STATES SURVEYOR-GENERAL FOR NEW MEXICO FOR THE FISCAL YEAR ENDING JUNE 30, 1903.

MORGAN O. LLEWELLYN.

A. Statement showing contracts for the survey of public lands awarded during the fiscal year ending June 30, 1903.

B. Contracts awarded for the survey of confirmed private land claims for the fiscal year ending June 30, 1903.

C. Surveys returned during the fiscal year ending June 30, 1903.

During the said fiscal year the following letters, documents, plats, field notes, and other papers have been prepared, briefed, and recorded, viz:

Letters to the Commissioner of the General Land Office	333
Letters to the Secretary of the Treasury	8
Letters to the Secretary of the Interior	8
Letters to deputy surveyors and individuals	1,329
Official letters received and recorded	263
Transcripts of field notes:	
Grant (96 pages)	5
Township (1,595 pages)	51
Mineral (558 pages)	52
Mineral monuments (40 pages)	8
Deputies in the field (796 pages)	79
Small-holding claims (928 pages)	18
For examiner (149 pages)	12
Total (4,162 pages)	225
Transcripts for surveyor-general of Arizona and the War Department (25 pages	2
Township plats	50
Amended township plats	13
Copies of township plats	9
Exterior township plats	9
Enlarged small-holding plats	54
Mining-district plats	6
Mineral-monument plats	6
Grant plats	6
Mineral plats	110
Diagram plats for General Land Office	4
Other plats	2
Outline plats or tracings for deputy surveyors	10
Diagrams to accompany contracts, special instructions, and examinations	29
Mining claims copied for use of deputies in the field	3
Recitals and descriptive notes for patents of grants (497 pages of typewritten recitals made in duplicate)	16
Notices for publication, survey of private land claims in English and Spanish languages, in triplicate, and compared	4
Translations (811 pages)	56
Copies of certified copies of notices of location, amended locations, and applications for the survey of mining claims (194 pages)	71
Descriptive lists for land office (26 pages)	13
Annual report, estimates, etc. (46 pages), in triplicate	4

Semiannual property return (36 pages), in duplicate	2
Accounts current, in duplicate	34
Abstracts, in triplicate	51
Vouchers, in duplicate, for all accounts	170
Contracts and bonds, in quadruplicate	7
Special instructions for the survey of public lands, grants, and small-holding claims, in quadruplicate	11
Total number of typewritten pages contained in said special instructions	201
Surveyor-general's reports to Commissioner General Land Office, on grant surveys, in duplicate (40 pages)	4
Special instructions for examination, in duplicate	3
Official orders for the survey of mining claims	35
Tracings to accompany contracts	106
Tracings, miscellaneous	49
Books of field notes examined and corrected	144
Books of field notes lettered	40
Placards and labels lettered	10
Deputy surveyors' commissions lettered	2
Recorded mining claims in mining docket	55
Protracted mining claims on mining-district plats	55
Docketing and filing papers in grant case	120
Latitude and departure tables, made and checked	130
Copies made of grant decrees and orders from the Court of Private Land Claims and compared	6
Applications, approvals, etc., for extension of time on contracts, in triplicate	7
Clerk's certificate and orders of Court of Private Land Claims lettered on grant plats	21
Miscellaneous blueprints made and mounted	27
Miscellaneous plats mounted	6
Official Territorial maps corrected by placing thereon the land districts, forest reserves, and new counties	12

During the said fiscal year the following lines of surveys have been established, viz:

Character of work.	Measurements.		
	Miles.	Chains	Links.
Subdivisional lines reestablished	6	5	63
Standard lines reestablished	18		
Township and range lines	99	51	76
Township and range lines reestablished	32	22	63
Subdivisional lines	536	61	5
Meander lines			
Grant lines	7		95
Grant lines reestablished	9	44	60
Small-holding claims	57	49	76
Connecting lines, small-holding claims	34	46	77
Connecting lines of public surveys with grants	19	28	50
Total	820	71	65

During the past fiscal year tracings and descriptive lists have been furnished to district land offices as follows:

	Land offices.				
	Santa Fe.	Las Cruces.	Roswell.	Clayton.	Total.
Township plats	1				1
Fractional township plats	15	1			16
Mining plats	16	7	2		25
Descriptive lists, sheets	14	2			16
Small-holding plats	2				2
Total	48	10	2		60

MINERAL SURVEYS.

Mineral surveys executed during fiscal year ending June 30, 1903	55
Surveys ordered, returns not filed	14
Amended surveys ordered	2
United States mineral monuments established and approved	3
Total	74

During the said fiscal year there has been deposited on account of surveys and amended surveys of mining claims the sum of $2,280, and applications were made for the survey of 67 mining claims and the amended survey of 2 mining claims.

PRIVATE LAND CLAIMS.

The docket of land grants on file in this office shows that there are still 4 private land claims or grants pending before the court of private land claims, of which one case is under advisement and three cases are still pending on survey. In addition to the above this office has instructions to contract for the survey of 2 land grants which were confirmed by acts of Congress, the same having been surveyed, but the surveys were never approved by the Commissioner of the General Land Office.

SMALL-HOLDING CLAIMS.

There have been 4,489 small-holding claims filed in this office under the provisions of sections 16 and 17 of the act of March 3, 1891, as amended, for tracts of land not exceeding 160 acres each.

Contracts have been awarded for the survey of some 1,500 small-holding claims. Said filings cover, in a majority of instances, from 2 to 6 tracts, and a conservative estimate of the number of tracts embraced in these small-holding applications still to be surveyed is 9,200. Where such tracts are embraced in townships to be surveyed the surveys of such small-holding claims situate therein are executed at the time of extending the lines of public surveys over such townships, and where they are situate in townships heretofore surveyed per diem contracts for such surveys are awarded. The time limit within which such small-holding filings could be filed in this office expired with March 3, 1901.

The platting of these small-holding claims is very complicated, and aside from showing the same on the township plats, small-holding plats on an enlarged scale are made in triplicate, showing sometimes only one or two sections, which often necessitates the making of 27 to 30 small-holding plats for one township. When small-holding claims are situate in townships to be surveyed, the subdivisional rate of mileage only is allowed the deputies for establishing the boundaries of such claims and connecting the same to corners of public surveys. These small-holding tracts entail a vast amount of labor in the hauling of stone for monuments, setting and marking corners for all angles of such irregular tracts, and payment is allowed for one boundary only if the same is a common boundary with an adjoining small-holding claim surveyed by the same deputy; and by reason of having to write the field notes complete for each tract, setting and marking the corners for same, and connecting two corners thereof to a corner of the public survey, the deputies complain that they can not make living wages at the low rates of mileage now paid, and are loath to accept contracts for this class of work. The law in this case should be changed to allow the awarding of contracts for all small-holding surveys at per diem rates, whether the same be in townships heretofore surveyed or in townships to be surveyed, and this embarrassment removed. Payment for the execution of small-holding surveys is made from the appropriation for the survey and resurvey of public lands, and for that reason the amount of the appropriation to be apportioned to the Territory of New Mexico should be increased.

EXAMINATIONS.

Examinations of grant surveys have been made in the field, as follows:

Santo Tomas de Yturbide Colony Grant (Rep. No. 139, P. L. C. Docket No. 137), situate in Donna Ana County, N. Mex., as surveyed by Jay Turley, deputy surveyor, under special instructions dated September 11, 1902.

Field examinations have been made of the public surveys under the following contracts: Nos. 345, 351, 354, 358, 359, 360, and 363.

Field examinations have also been made of the reestablishment of public land lines in connection with the contracts for grant surveys, and reestablishing boundaries of old grants found necessary to be established in order to show proper connections and areas to be excluded.

EXHIBIT A.—*Tabular statement of contracts awarded under appropriation for the survey of public lands for the fiscal year ending June 30, 1903.*

No.	Date.	Surveyor.	Liability.	Description.
360	1902. Aug. 20	Geo. H. Pradt.....	$425.00	A portion of the exterior and subdivisional lines of Ts. 14, 15, and 16 N., Rs. 6 and 7 W., with small-holding claims located therein.
361	....do...	Joseph F. Thomas....	3,163.25	Exterior and subdivisional lines of Ts. 25 N., R. 2 E., 26, 27, and 28 N., R. 8 E., and 28 N., R. 9 E., and all small-holding claims located therein.
363	Dec. 3	John H. Walker.....	2,610.32	The exterior and subdivisional lines of Ts. 14 N., R. 1 W., 15 N., R. 2 W., 10 N., R. 21 E., 23 N., Rs. 9 and 10 E., 14 N., Rs. 16 and 17 E., and 23 N., R. 17 E., and all small-holding claims located therein.
364	....do...	Wendell V. Hall	1,701.43	The exterior and subdivisional lines of Ts. 5 N., Rs. 7 and 9 E., 6 N., R. 6 E., a portion of 6 N., R. 5 E., and all small-holding claims located therein.
(a)	Oct. 9	John H. Walker.....	100.00	Frac T. line between Ts. 11 and 12 N., R. 5 E.

EXHIBIT B.—*Tabular statement of contracts awarded under appropriations for the survey of confirmed private land claims for the fiscal year ending June 30, 1903.*

No.	Date.	Surveyor.	Liability.	Description.
(a)	1902. Sept. 11	Jay Turley.....	$131.00	Survey of a portion of the east boundary of tract No. 1 of the Santo Tomas de Yturbide colony grant (Rep. No. 139, P. L. C. Doc. No. 137).
362	Nov. 5	Wendell V. Hall	1,636.50	Survey of the exterior boundary and connecting lines of the Santa Teresa grant (Rep. No. 11, P. L. C. Doc. No. 168); the San Miguel del Bado grant (Rep. No. 119), and the Refugio colony grant (Rep. No. 90, P. L. C. Doc. No. 150).
365	1903. May 18	John H. Walker.....	1,401.00	The exterior boundary and connecting lines of the Antoine Leroux grant, confirmed by act of Congress approved Mar. 3, 1869.
366	....do...	.....do	208.61	The exterior boundary and connecting lines of the Alexander Valle grant, confirmed by act of Congress approved June 21, 1860.

EXHIBIT C.—*Tabular statement showing surveys, returns for which have been filed during fiscal year ending June 30, 1903.*

No.	Date.	Surveyor.	Liability.	Description.
330	1899. Apr. 12	John H. Walker.....	$3,000.00	Establishment of exterior and subdivisional lines of fractional T. 10 N., R. 20 E. Part of returns reported last annual report.
345	1900. Aug. 30	George Lynch.....	2,000.00	Survey part of T. 2 S., R. 1 W., and all small holding claims located therein.
(a)	1902. Sept. 11	Jay Turley	131.00	Survey part of east boundary tract No. 1, Santo Tomas de Yturbide colony grant.
351	1900. Nov. 21	.....do	4,712.00	Exterior and subdivisional lines of T. 27 N., R. 7 E., 9 S., R. 17 E., 28 N., R. 5 E., 15 N., Rs. 1 and 2 E., 18 N., R. 10 E., and small holding claims located therein. Remainder of contract canceled.
354	1901. May 15	Joseph F. Thomas....	2,356.00	Exterior and subdivisional lines and small holding claims in Ts. 30 N., Rs. 7 and 8 E., and 11 N., R. 14 and 15 E.
358	1902. Apr. 3	John H. Walker.....	4,000.00	Exterior and subdivisional lines and small holding claims in T. 21 N., R. 12 E. and T. 18 N., R. 15 E. Remainder of returns not yet filed.
359	Apr. 4	Jay Turley	8,900.00	Exterior and subdivisional lines and small holding claims in Ts. 20 S., R. 30 E. and 17 S., R. 13 E. Remainder of returns not yet filed.
360	Aug. 20	George H. Pradt.....	425.00	A portion of the subdivisional and exterior lines of Ts. 14, 15, and 16 N., Rs. 6 and 7 W.

a Special instructions.

REPORT OF THE INTERNAL-REVENUE COLLECTOR.

A. L. MORRISON.

Collections of internal revenue for the fiscal year ended June 30, 1903, in New Mexico.

List, being collections of penalties and compromises for violations of law	$469.06
Beer stamps	5,593.80
Tax-paid stamps	2,079.44
Cigar and cigarette stamps	2,731.20
Tobacco stamps	174.00
Documentary stamps	118.00
Special-tax stamps	22,753.35
Total	33,918.85

THE FOREST RESERVES OF NEW MEXICO.

By I. B. HANNA, *Superintendent of Forest Reserves in New Mexico and Arizona.*

The Pecos River Forest Reserve, in northern New Mexico, was created by Presidential proclamation on January 11, 1892, and increased to its present dimensions May 27, 1898. The timber within this reserve consists principally of spruce pine and is considered one of the finest bodies of timber in the Southwest. It was created to protect the headwaters of the Santa Fe, Mora, Gallinas, Tecolote, Manuelitas, Nambe, and Pecos rivers, and to provide a permanent and abundant water supply to the people of Las Vegas, Santa Fe, and residents of the reserve and vicinity, as well as for the protection of the timber within its boundaries.

The grazing is limited to cattle and horses (sheep and goats being prohibited), the privilege being granted first to those living in the reserve and keeping their stock therein; second, to people living outside of the reserve, but owning ranch or farm property inside and keeping stock in the reserve; third, persons living near the reserve and using the reserve as their principal or only summer pasture; fourth, people living at a distauce, 10 miles or more, and wintering their stock in localities distant from the reserve, and driving them from such winter ranges to the reserve each year.

This reserve is becoming more popular with the succeeding years as a summer resort, game of all kinds being well protected within its limits. Owing to the vigilance of the forest rangers no serious forest fires have occurred therein.

The Gila River Forest Reserve was created by proclamation March 2, 1899, and is located in the western part of Grant and Socorro counties. It consists of 2,327,040 acres of land. The timber is principally spruce pine. Cattle, horses, sheep, and goats are allowed to graze within this reserve in limited numbers, confined principally to residents of the reserve. During the past year cattle and sheep grazing districts were created by Supervisor R. C. McClure, in order to equitably divide and save the grazing for future use. The mining and stock interests in this reserve are large.

The Lincoln Forest Reserve was created by proclamation July 26, 1902. It is located in Lincoln County and consists of approximately 500,000 acres of land situate on and in the vicinity of the Capitan and White Mountain ranges. The timber thereon consists principally of spruce pine. Sheep, goats, cattle, and horses are pivileged to graze in limited numbers, confined chiefly to resident owners.

The honorable Commissioner of the General Land Office on September 1, 1903, ordered the withdrawal from settlement or any appropriation for reserve purposes the tract of land known as the Jemez and Nacimiento country lying within Sandoval and Rio Arriba counties. The area withdrawn is as follows: Beginning at the southeast corner of township 17 north, range 5, thence northerly to northeast corner of township 20 north, range 5; thence westerly to the southeast corner of township 21 north, range 4, all north and east; thence northerly along range line to the thirty-sixth standard parallel north; thence westerly to northwest corner of township 24 north, range 1 west; thence southerly along range line to boundary of old San Joaquin del Nacimiento claim; thence in general southwesterly and easterly direction along said boundary to range line between ranges 1 and 2 west; thence southerly to southwest corner of township 19 north, range 1 west; thence easterly to southeast corner of said township; thence southerly along New Mexico principal meridian to intersection with eastern boundary of Ojo del Espiritu Santa grant; thence southeasterly along said boundary to intersection with fourth standard parallel; thence easterly along said parallel to place of beginning.

The tract reserved contains much valuable timber that it is the purpose of the Government to protect for future uses.

The object of forest reserves, as laid down by the Forest Reserve Manual, is as follows:

"The object of these reserves is to maintain forests on lands where they are needed, for two principal reasons:

"First, to furnish timber, a much needed and valuable product, from lands which are unfit to produce a more valuable crop, such as corn or wheat.

"Second, to regulate the flow of water. This they do—(*a*) By shading the ground and snow and affording protection against the melting and drying action of the sun; (*b*) by acting as wind-breaks and thus protecting the ground and snow against the drying action of the wind; (*c*) by protecting the earth from washing away and thus maintaining a storage layer into which rain and snow water soak and are stored for the dry seasons when snow and rain are wanting; (*d*) by keeping the soil more pervious so that the water soaks in more readily and more of it is thereby prevented from running off in time of rain or when the snow is melting."

Large areas of forest, public and private, are destroyed each year by fire. This destruction is an injury to everyone and is a great damage, especially in all mountain countries where a regular flow of the streams is of vital importance. The forest is the most effective means of preventing floods and producing a more regular flow of water for irrigation and other useful purposes.

As the people learn the purposes and reasons for the creation of forest reserves and the benefits arising therefrom a more favorable sentiment is inculcated toward them. In time the people of the Southwest will become ardent supporters of the reserve system, by reason of the necessity for protecting the various watersheds from being skinned of the timber thereon for mercantile and speculative purposes.

The Government believes that in creating forest reserves it is working in the interests of its people; time will prove this to be true.

THE NATIONAL SANATORIUM FOR TUBERCULOSIS AT FORT STANTON.

DR. P. M. CARRINGTON, *Medical Officer in Command.*

In two respects the national sanatorium for tubercular sailors of the merchant marine at Fort Stanton is of particular interest to the people of New Mexico. One is that through it the Government spends in the Territory annually between $75,000 and $100,000. The other is that the officials at the sanatorium are constantly adding to the professional knowledge of consumption and the proper method of its treatment; are presenting daily object lessons in a subject which appeals especially to this part of the world because of the large number of consumptives who seek relief here. They are missionaries who, by disseminating what they have learned in three years of practical experience with consumption, put the victims of that disease in possession of facts which enable them to gain the health they came west to seek.

It is with the hope that this article will reach consumptives, the friends or relatives of consumptives, or men and women anxious to assist, even remotely, in the treatment of consumption that I so gladly write it.

FORT STANTON.

Fort Stanton is located on the south bank of the Rio Bonito, which has its source in the White Mountains 18 miles above, and which, with the Rio Ruidoso, which it joins 20 miles below, flows southeasterly into the Rio Pecos at Roswell. It is 106 miles north and a little east of El Paso, lying 32 miles southeast of the main line of the Rock Island Railroad. It is 7 miles from Capitan, which is connected with the main line of the Rock Island by a branch running from Carizozo. Capitan is the nearest town, as well as the nearest railroad connection. It has a population of about 1,000, its chief industry being the production of coal. The Bonito Valley is from one-fourth to one-half of a mile wide and is heavily wooded with large cottonwoods and willows. Fort Stanton is 10 miles above Lincoln, the county seat of Lincoln County.

Fort Stanton was established as an army post in 1855 for the control of the Mescalero and White Mountain Apaches. With one or two intervals it was maintained as a military post until about ten years ago, when it was abandoned until 1899, when the reservation was transferred from the War to the Treasury Department and made a station of the Public Health and Marine-Hospital Service, which is one of the many bureaus of the Treasury. At that time the post was about to fall to pieces of its own accord. The buildings were in a dilapidated condition, walls were crumbling, roofs were caving in, the big cottonwoods were dying for lack of water, and weeds were running wild over the portions which had been cultivated and kept up. In the last three years the work of reconstruction has been going steadily on until to-day the buildings are beautiful and substantial, and the cultivated portions yielding, well cared for, and properly kept up.

The reservation includes 38 square miles, nearly all of which is fenced. A herd of beef cattle has been built up, 80 acres is in alfalfa, enough of which is raised to feed the horses and dairy herd, and a large tract has been converted into a garden, where much, but not all, of the produce necessary to the sanatorium is raised. The buildings at Fort Stanton are adobe and brick and sit on the four sides of a parade ground 100 yards square, which is sown in blue grass.

OF HISTORIC INTEREST.

One or two points about Fort Stanton are of historic interest. In the old soldiers' cemetery, south of the post, is the grave of a child of the late General Lawton, who was on duty at Fort Stanton in the earlier years of his service at Fort Stanton. Just below the fort, near the Rio Bonito, is a large cave, which has never been thoroughly explored by white men. Attempts by both soldiers and marine-hospital officers to

find the end of the cave or a second opening have failed, although parties have traveled through it for several days at a time. A current of fresh air circulates throughout all the passages constantly, indicating that there is a second opening, and it is said that once a band of Indians, closely pressed by soldiers, entered the cave and later was seen 30 miles away, although a watch at the reservation opening had been kept for several days.

HOW PATIENTS ARE ADMITTED.

Patients are admitted at Fort Stanton through the United States marine hospitals, which are maintained by the Government at the lake, river, and ocean ports of this country and its possessions. Their railroad fare is paid to and they are treated and cared for free at the sanatorium and given half rates to their homes when they are discharged. All forms of tuberculosis are treated, but practically all the cases are of a pulmonary character.

CLIMATE.

Extreme dryness, purity of the atmosphere, and a large number of sunshiny days characterize the climate at Fort Stanton. The altitude is 6,150 feet, which often produces a wide range of temperature. Taken year in and year out, however, the winters may be said to be mild and the summers cool. The records for the past three years show the highest temperature to have been 98.7°, the lowest 2°, and the mean 53.6°. The low temperatures invariably occur at night. Even in the winter months it is almost always mild enough for patients to sit out of doors in the day. There were 276 clear days in 1902, 53 partly cloudy days, and 33 cloudy days. On an average there are about 340 days each year when the sun shines some part of the day. The precipitation is from 14 to 17 inches, much of which is snow that falls during the winter.

Living out of doors, which is the major part of our treatment of consumption, is possible nearly every day of the year in such a climate as we have at Fort Stanton. Wounds of all kinds heal quickly and easily without infection, even in cases where little care has been given them. The altitude makes deeper breathing necessary, thus requiring the patients, unconsciously, to exercise their lungs much more than they could, even with systematic efforts, at sea level. Our records show a greatly diminished liability to hemorrhage, doubtless due to the decreased barometric pressure.

ALL KINDS OF CASES ADMITTED.

Consumptives in all stages are admitted to the sanatorium, as well as consumptives with many or all of the complications common to the disease. During the year ending April 30, 1903, we treated 282 cases, only 39 of which were of the first stage. In reviewing our statistics it must be borne in mind that the rapidity of improvement and the chances of ultimate recovery decrease in proportion to the development of the disease in the patient when he reaches us. My classification of the patients is into the first stage, in which the disease has not progressed to consolidation, which may be detected by physical signs; and into the second and third stages, in which the physical signs reveal consolidation, with or without excavation or cavities. I group the second and third stage cases together because it is difficult and sometimes impossible to know when a patient passes or has passed from the one to the other.

PATIENTS LIVE IN TENTS.

Since early in my assignment to duty at Fort Stanton I have been an ardent advocate of the tent as a dwelling for consumptives. I began the experiment with two or three patients, and it was such a success that I now have over 50 patients in tents and have quartered more than 100 in that manner during the past eighteen months. Our tents are floored and have board walls, and are furnished with small sheet-iron stoves. Some have windows, but the best and easiest method of ventilation is the rolling back of the canvas walls which fit over the board walls, allowing the air to enter over the tops of the board walls. In mild winter weather and throughout the summer the walls are kept up and the front and back flies open from sun to sun. Cases in all stages of development are quartered in tents, and in nearly all improvement has been more marked and much more rapid than the improvement of those in rooms. In but few instances has it been necessary to remove patients from tents back to the dormitories. I have recently received an additional quota of 50 tents and intend to put them into use as fast as patients arrive to fill them.

MEDICAL STAFF.

The medical staff at the sanatorium is composed of doctors of the Marine-Hospital Service. It consists of 1 surgeon, who is the commanding officer, 2 other commissioned officers, and 2 acting assistant surgeons. One of the junior officers serves as officer of the day each day, his tour of duty being from 6 a. m. to 6 p. m. It is his duty to make a daily inspection of all dormitories, toilet rooms, hospital, etc., and to report their condition to the commanding officer. He also answers emergency calls and receives new patients. Two of the officers have charge of the examination room. Patients are examined upon admittance and at intervals of two months throughout their stay at the sanatorium. Records of their condition from date of entry until discharged are accurately kept.

One officer devotes all his time to the bacteriological department. The major part of his work is the examination of sputum. Records are kept of the condition of the patient's sputum at date of admission and during his term of treatment. Another officer has charge of the spray room where nose and throat troubles are treated. This is an important and interesting phase of our work, as many of the patients suffer from nasal, tracheal, and bronchial complications.

Morning sick call is at 9 o'clock, and I have endeavored to make this something of a feature in the daily life of the patients. All who are able to be about—usually upward of 100—are assembled on the parade ground by a drill master, who puts them in open order for "setting up" exercises. The men are given ten or fifteen minutes of breathing exercises, after which I pass down the line with a nurse, speak a word or two to each man, and prescribe for those who need medicine. The breathing exercises are undoubtedly of value. They invariably increase the chest expansion and, I believe, help to build up the tone of the entire system.

Immediately following the general sick call I or the officer of the day visits the hospital to make sick call among the patients who are unable to attend the regular formation. Evening sick call is made at 5.30 o'clock by the officer of the day, who visits the patients in their quarters. In addition to the attention given the patients by the officers is that bestowed upon them by the nurses. We have half a dozen experienced male nurses, among whom the patients are divided. These practically live with the patients, attend to their minor complaints, look after their comfort generally, and assist in enforcing discipline.

SPECIALLY VENTILATED QUARTERS.

While I endeavor to have all men live in tents who can, there are a large number who prefer to live in buildings, and whom I have permitted to have their choice. These buildings, however, have been especially modeled with a view to allowing as much air to circulate through them as possible. One of our new dormitories—I call them dormitories instead of wards because the patients are not allowed in them except at night or for a short nap after dinner—is divided into 30 rooms, each of which accommodates two patients. Each room has doors or windows opening outdoors, and these must be kept open, even in the winter months. The rooms are heated by stoves or fireplaces, which I prefer to steam because of the likelihood to overheating from the latter. The purity and dryness of the atmosphere make it almost impossible for patients to "take cold," even though they sleep in the cold air and would believe they were exposing themselves if they did the same thing at sea level.

Two of our other dormitories are arranged interiorly like wards in a city hospital, being composed of long, narrow rooms, in which there are beds for from half a dozen to twenty patients. These are dormitories in the true sense of the word, for the patients have no closets, bureaus, wash stands, or other room furniture except a bed, an iron bedside stand, with a glass top, and a chair. Each dormitory is supplied with a storeroom where patients may store their trunks and clothes. The nurses have entire charge of the bedding and furniture of these buildings, which are fitted with tub and shower baths, lavatories, etc., which the patients use in common. We use the first dormitory mentioned, where patients have their own rooms, for the convalescent cases, and the two latter for those not ill enough to go to the hospital nor well enough to be without the direct jurisdiction of the nurses.

An important duty of the nurses in all the dormitories is to keep the doors and windows open and the patients out of doors during the day and early evening. Each dormitory has a broad gallery or porch running across its front, supplied with plenty of reclining and rocking chairs, where the patients may sit to read or to play games in the shade if the sun is hot or under shelter if it rains. In the summer months we keep the men out of doors, but protected from the sun during the heated parts of the day. In the winter we keep them out of doors in the direct rays of the sun.

We have two nurses on duty at the hospital where the worst cases are kept. Even these are given as much outdoor air as possible. During the day they are rolled into the shade of the trees if they are able to sit up. If they are too weak for this we carry them out on mattresses and lay them on beds under tent flies stretched in the shade of the trees, carrying them back to their beds in the hospital at night.

TREATMENT.

We treat consumption at Fort Stanton by building up the general tone of the patient's system. No specific cure for consumption has yet been discovered, so we call upon nature to effect the repair to destroyed tissue. To strengthen and build up the body we have three prescriptions, each of which is of the greatest importance. They are rest, outdoor life, wholesome food.

I wish to emphasize the importance of rest to a consumptive. There is much more danger from overexercise than from overrest. At Fort Stanton we keep a close watch on each patient and prescribe rest and exercise according to the indications in the individual case. More than enough rest is much better than too little, and too much exercise is suicidal. Even the best cases should take their exercise with great caution, and the advanced cases should be given absolute rest. Mr. Edwards, of Coronado Beach, Cal., has said that "it is madness for a consumptive to come to California in search of health without ample means to provide all the luxuries and comforts." I am convinced that this statement is equally true of New Mexico.

The common advice to consumptives to "go west and rough it on a ranch" I am confident has been responsible for a great number of fatalities in patients who would otherwise have recovered. I know personally men and women who came to New Mexico ten, fifteen, or twenty years ago suffering from consumption, some so feeble that they had to be carried on stretchers, who are now in perfect health. This convinces me that this climate is of great benefit to consumptives who will eat wholesome food, rest, and live out of doors. I myself was a consumptive when I came to Fort Stanton nearly three years ago, and have been cured without other treatment than that which we prescribe at the sanatorium.

DIETARY.

The dietary at the sanatorium is ample in quantity, the best we can make it in quality, and as varied as our isolated position will permit. Our aim is to give the patients plenty of good, wholesome, plain, nourishing, well-cooked food. We produce our own milk, but the number of patients has increased so rapidly that we do not have as much as I would wish nor as much as we will have in the future. The supply is now limited to one and one-half quarts per patient per diem We have found milk, as well as eggs, to be a good food for consumptives, which we supply in addition to the regular meals twice each day.

An important phase of the food supply at Fort Stanton is our garden, where we grow all vegetables in abundance, as well as very fine cantaloupes and watermelons. Besides enjoying fresh vegetables throughout the season, we store for winter use large quantities of cabbages, carrots, turnips, onions, etc.

AMUSEMENTS AND EXERCISE.

One of our greatest problems is to keep patients in a healthy frame of mind. The isolated position of Fort Stanton, while it is excellent in that it gives the patients no opportunity to go to the cities to dissipate, has a tendency to make the men lonesome. It is almost as essential to keep them in good spirits as to keep them physically as well as possible. With our limited means, however, we try to make the daily life as pleasant and diverting as possible. One of the chief amusements is croquet, which is an excellent game for consumptives because no violent exercise is required. We have three sets, on which there are 4 and 6 handed games going from early in the morning until it is too dark to see. We also have a golf course, and encourage such patients as are able to take up the game. It is fine exercise for patients who have but slight involvement, although for advanced cases it will not do at all. Owing to the kindness and generosity of Miss Helen Gould we have a large library of standard and current literature, from which much pleasure is derived by the patients. We are very careful, however, to allow no reading in the library or patients' quarters. Reclining chairs and hammocks are scattered profusely over the place, and we require all who read to sit out of doors. In the near future we expect to put in bowling alleys, which I believe will prove beneficial to early stage cases. A number of patients own horses and take a great deal of pleasure in riding, but here again

we exercise great care, as riding is detrimental to all except the very earliest stage cases. A large number of the best cases are employed at light labor about the sanatorium and a number of others are employed as hostlers for the officers. The patients who own their own horses find diversion and pleasure in caring for them. We provide them with stalls in the corral, but require them to buy their own feed.

On the whole, the discipline of the sanatorium is good and the patients are in a healthy condition mentally. There are occasional cases in which the patient does not appreciate what the Government is trying to do for him. He usually drinks whenever he can get to Capitan, sometimes brings liquor onto the reservation, stirs up discontent among otherwise contented patients by insubordinate talk, and complains of everything he can find to complain of. We invariably deal summarily with this sort of man, as a patient like him does more harm than we can do him good. Our usual punishment is to dismiss him from the sanatorium. Our work at Fort Stanton has showed us that the more obedient, cheerful, and contented a patient is the greater are his chances of improvement and recovery.

PREVENTION OF INFECTION.

It can readily be seen that it is of the greatest importance to prevent the sanatorium becoming infected, as in such a calamity the surrounding natives, the healthy employees, and the cured or nearly cured cases would be exposed to grave danger. We enforce rigid antispitting rules, requiring the patients to deposit their sputum in cups, some of which are metal for the pocket and are sterilized daily in a sterilizer made especially for that purpose, and some of which are metal, with paper fillers, which are destroyed by fire every morning. In addition to this precaution all quarters occupied by consumptives are disinfected periodically. Recent experiments of injecting dust from consumptives' rooms into guinea pigs has proved that the quarters are free from infection. We endeavor to impress on the patients the importance of the spit cup, and when they leave, if they are not cured, supply them with cups and ask them to spread the knowledge they have gained as far as possible.

STATISTICS FOR YEAR ENDED APRIL 30, 1903.

Cases under treatment at beginning of year	115
Cases admitted during the year	167
Total	282

The tables given below show the following results, eliminating the cases under treatment less than one month:

For the year just ended:	Per cent.
Died	29
Unimproved	7.2
Improved	52.4
Apparently recovered	11.3

The consolidated statistics for the entire period since the opening of the sanatorium until April 30, 1903, computed on the same basis, give the following results:

	Per cent.
Died	24.9
Unimproved	2.8
Improved	54.2
Apparently recovered	18.1

These statistics deal only with the cases in which treatment has terminated.

It will be observed that our statistics do not show as good results during the last year as we have previously obtained. This is due mainly to the fact that the character of the cases admitted during the past year has undergone a proportionate change for the worse, whereas during the former period we received 20 per cent of first-stage cases and 80 per cent of second and third. During the past year we have received but 15 per cent of first-stage cases and 85 per cent of second and third, of whom the far advanced cases form a much larger proportion than during the former period. There are also now under treatment several recovered cases who are about ready to be discharged, but who do not figure in these statistics for the reason that they are still officially borne on the rolls as being under treatment. There continues to be a difficulty in retaining patients under treatment for a sufficient length of time, and during the year I have seen case after case leave the sanatorium in a condition

just short of complete recovery. When advised to remain these patients say: "Why, I feel as well as I ever did in my life," and they can not be made to understand that it is not a matter purely of sensation. The importance of early diagnosis and treatment is shown by the following results by stages: Of the first-stage cases 50 per cent have recovered, 37.5 per cent were discharged improved, and 12.5 per cent were discharged not improved, whereas of the second and third stage cases 5.6 per cent recovered, 54 per cent were discharged improved, 7.3 per cent were discharged not improved, and 33 per cent died.

Result.

	Series 1—115 patients under treatment Apr. 30, 1902.	Series 2—167 patients admitted between Apr. 30, 1902, and Apr. 30, 1903.
Died	16	28
Discharged unimproved	4	7
Discharged improved	39	26
Discharged apparently cured	10	4
Still under treatment	46	102
Total	115	167
AGES.		
Under 25 years	15	18
From 25 to 34 years	44	65
From 35 to 44 years	34	53
From 45 to 54 years	16	23
Cases 55 years and older	6	8
Total	115	167

	Number of cases.	
	Series 1.	Series 2.
History of tuberculosis in parents	[a] 7	[b] 29
Both lungs affected	84	155
One lung involved	31	12
Tuberculi bacilli demonstrated in sputum	110	147
Pulmonary hemorrhage occurred	53	60
Hemorrhage before, but not after admission	24	48
Hemorrhage after, but not before admission	6	3
Both before and after admission	23	9

[a] 6 per cent. [b] 17 per cent.

Of the 134 cases who died or were discharged during the year, 10 cases were under treatment less than one month, and all were in series 2. Of these 8 died and 2 were discharged unimproved.

Complications.

	Series 1.	Series 2.	Total.
Larynx involved	3	14	17
Syphilis	15	13	28
Meningitis	1	1	2
Testicles involved	2	1	3
Fistula in ano	2	3	5
Nephritis	6	1	7

Heart disease (organic) in 11 cases.
Pericarditis in 1 case.

Pneumothorax is the most fatal of all complications, and no amount of forethought and care seems sufficient to prevent its occurrence, it occurring sometimes in cases which have been making steady improvement. One of our cases occurred in a patient who had gained 25 pounds in weight and who seemingly had every prospect of continued improvement and ultimate recovery. Our pneumothorax cases have been universally fatal, with the exception of 1 case which occurred about three months ago, and which is still under treatment, but even this case is expected to terminate fatally within a short time.

Classification.

	First stage.		
	Series 1.	Series 2.	Total.
Cases treated	14	25	39
Results:			
Died		1	1
Discharged unimproved		2	2
Discharged improved	2	4	6
Discharged apparently cured	5	3	8
Still under treatment	7	15	22

In the fatal case death was due to softening of brain.

	Series 1.	Series 2.	Total.
But 1 lung involved	9	7	16
Both lungs involved	5	18	23
Tubercle bacilli were found in sputa	11	17	28

In 54.5 per cent of cases where tubercle bacilli were not found there was history of syphilis.

Hemorrhage occurred in 6 cases of this class.

Of the 17 cases of this class in which treatment has terminated (discarding the brain case), the results are:

	Series 1.	Series 2.	Total.	Per cent.
Improved	2	4	6	37.5
Not improved		2	2	12.5
Apparently cured	5	3	8	50

The average gain in weight for the two months between October 1, 1902, and December 1, 1902, was 4.6 pounds.

New patients average for the first two months after arrival a gain of 4.26 pounds.

These figures include all cases except a few not in a condition to be put on the scales.

	Second and third stages.			
	Series 1.	Series 2.	Total.	Per cent.
Cases treated:	101	142	243	
Tuberculosis in parents	7	24	31	
Both lungs involved	79	127	216	
But 1 lung involved	22	5	27	
Tubercle bacilli not found	2	12	14	
Larynx involved	3	14	17	
Syphilis occurred	10	7	17	
Results of treatment were:				
Died	16	27	43	17.7
Discharged unimproved	4	5	9	3.7
Discharged improved	36	22	58	24
Discharged apparently cured	6	1	7	2.5
Still under treatment	39	87	126	52

Of the 27 fatal cases in series 2, 7 were under treatment less than one month, and 1 case discharged not improved was also under treatment less than one month; and of the 7 cases, 1 arrived with a pyopneumothorax of some duration, 1 had a severe hemorrhage on the train, and 1 had organic heart disease.

Pulmonary hemorrhage, exclusive of streaked sputum, occurred in 107 cases, as follows:

	Series 1.	Series 2.	Total.
Before but not after admission	23	47	70
Before and after admission	21	8	29
After but not before admission	6	2	8
	50	57	107

Of the 117 cases in which treatment has terminated:

	Number of cases.	Per cent.
Died	43	37
Not improved	9	7.7
Improved	58	50
Apparently cured	7	6

Eliminating the 7 fatal cases and 1 case discharged not improved, which were under treatment less than one month, the percentages are:

	Number of cases.	Per cent.
Died	36	33
Not improved	8	7.3
Improved	58	53
Apparently cured	7	6.4

General summary of all cases treated from the opening of the sanatorium to April 30, 1903.

	Old series.	New series.	Total.	Per cent.
Treated	303	167	470	
Died	45	44	89	19
Discharged not improved	9	11	20	4
Discharged improved	97	64	161	34
Apparently cured	38	14	52	11
Still under treatment		148	148	31.5

Cases died, discharged, and result.

	Number.	Per cent.
Died and discharged	322	
Died	89	27.6
Discharged not improved	20	2.8
Discharged improved	161	50
Discharged apparently cured	52	16

Eliminating the 27 cases of the former series and the 10 cases of the present series under treatment less than one month, the results are:

	Number.	Per cent.
Died	71	24.9
Discharged not improved	8	2.8
Discharged improved	154	54.2
Discharged apparently cured	52	18.1
Total died and discharged	285	

One of the above deaths was due to sarcoma.

UNITED STATES GENERAL HOSPITAL AT FORT BAYARD.

E. L. Comegys, *Medical Officer in Charge.*

At present the following new buildings are under construction: Hospital-corps barracks, laboratory, medical and quartermaster storehouses, officers' infirmary, and addition to enlisted men's infirmary. An electric-light plant is also being installed.

The following is a summary of patients, showing results obtained during the last fiscal year:

	Number.	Per cent.
Cases treated during the year	506	.....
Cases in hospital June 30, 1902	150	29.64
New and readmitted cases	356	70.36
Cases discharged improved	157	31.03
Cases discharged unimproved	73	14.43
Cases remaining improved	124	24.50
Cases remaining unimproved	89	17.59
Deaths during the year (including 2 who died en route)	63	12.45
Total number of cases improved	281	55.53
Total number of cases unimproved	162	32.02

Of the 356 cases, new and readmitted, during the year, there were:

	Number.	Per cent.
Discharged improved	84	23.59
Discharged unimproved	50	14.04
Remaining improved	95	26.69
Remaining unimproved	75	21.06
Total improved	179	50.27
Total unimproved	125	35.11
Deaths	52	14.60

Of the 150 cases in the hospital June 30, 1902, there were:

	Number.	Per cent.
Discharged improved	73	48.67
Discharged unimproved	23	15.33
Remaining improved	29	19.33
Remaining unimproved	14	9.33
Total improved	102	68
Total unimproved	37	24.67
Deaths	11	7.33

Recapitulation.

	Number.	Per cent.
Cases now remaining in hospital	213	.....
Number showing improvement	124	58.21
Number not showing improvement	89	41.79

REPORT OF THE NEW MEXICO SECTION OF THE CLIMATE AND CROP SERVICE OF THE WEATHER BUREAU.

[United States Department of Agriculture, cooperating with the New Mexico weather service.]

R. M. HARDINGE, *Section Director.*

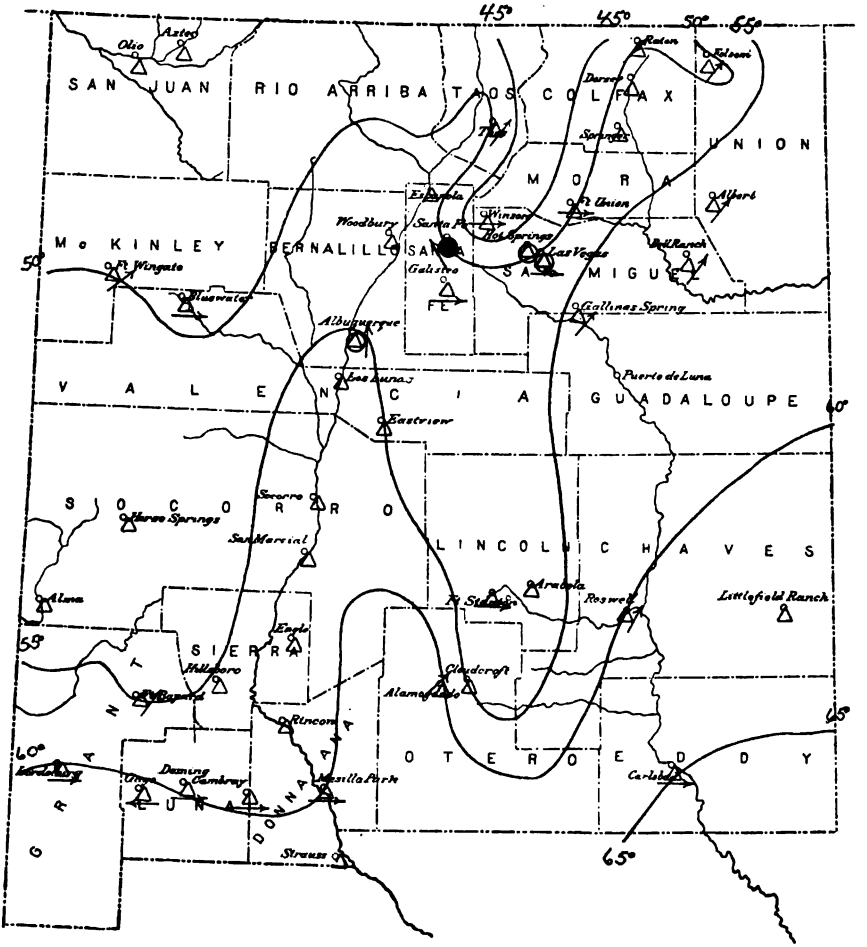
The organization of the section has not been changed during the year. The Territorial assembly of February, 1903, reduced the annual appropriation from $700 to $500. This money is used for the necessary printing of the section; all other expenses—for salaries, equipment of stations, stationery, etc.—are borne by the national service. As there is increasing demand for climatic data of New Mexico from year to year, the action of the assembly in reducing the appropriation for the printing and distribution of these reports is not deemed wise at this time.

During the year 3 stations were established and 6 discontinued. Of these 6 stations 5 were discontinued because of the removal of the volunteer observer to some other place, and 1 because business obligations demanded such frequent absences of the observer. All stations are fully equipped with standard instruments and shelter, excepting the special rainfall station of Golden.

The regular publications of the section are the Weekly Crop Bulletin, the Monthly Report, the Snowfall Bulletin, and the Annual Summary. The Weekly Crop Bulletin is made up from the reports of about 50 crop correspondents, representing fairly well the several agricultural and grazing sections of the Territory. Four hundred copies are issued weekly in the bulletin form, and the subject-matter of the bulletins is widely copied and reproduced by the press of the Territory. Copies are also sent to most of the leading produce exchanges of the country and to such applicants outside of the Territory as are interested in the seasonal progress of the crops. The Snowfall Bulletin is issued at the close of January, February, and March of each year, and consists of the summary of the reports of about 125 correspondents, with pertinent remarks on the visible water supply for the streams of the Territory. These snowfall bulletins are also widely copied by the press, and evidently have become a valuable addition to the work of the service. About 250 copies are issued for distribution. The Monthly Report and Annual Summary are quarto pamphlets, summarizing the monthly and annual climatological data of the several stations of the section. About 500 of the former and 800 of the latter are printed for distribution, monthly and annually.

The records of temperature and precipitation made by the army surgeons at the several posts extend in several cases over a period of twenty-five years. Since the organization of the climate and crop service in 1895 these records have been continued by the completer reports of the volunteer observers of the section, so that accurate and trustworthy data of almost every district of the Territory are available. Without doubt the scientific correlation of this data and its wide distribution is an influential factor in attracting the tourist and the settler. The advertisement of its climate, in connection with the resources of the Territory, shows that extensive tracts of its vast domain possess excellent conditions for sustaining life under circumstances more comfortable than almost anywhere else on the globe. It has been demonstrated by the experience of hundreds of sick that the climate of New Mexico possesses in a remarkable degree special qualities for the alleviation and cure of pulmonary tuberculosis and kindred diseases. After the most careful study of the subject, and with the experience of its medical servants in every section of the country, the Government selected Fort Stanton and Fort Bayard in New Mexico as the site for hospitals for the treatment of this dread disease.

The collection of this climatic data is made possible through the volunteer work of citizens in different parts of the Territory, who receive no money compensation for their services. The manifestation of such public spirit calls for the highest commendation from the general public that they so generously serve and benefit.



Arrows Fly with the Wind.

● Section center.

△ Voluntary meteorological stations.

○ Forecast display stations.

CHART SHOWING ANNUAL MEAN ISOTHERMS, PREVAILING WIND DIRECTION, FOR 1902 AND LOCATION OF METEOROLOGICAL AND FORECAST DISPLAY STATIONS.

KILLING FROSTS, 1902.

But few observers recorded the dates of frosts, and the dates in the table are those on which the last temperature of 32° or lower was recorded in the spring and the first fall to 32° or lower in the autumn.

	Last of spring.	First of autumn.		Last of spring.	First of autumn.
Alamogordo	Apr. 31	Nov. 3	Horse Springs	May 22	.....
Albert	Apr. 1	Do.[a]	Las Vegas	Apr. 26	Oct. 3
Albuquerque	Apr. 23	Do.	Las Vegas Hot Springs	...do	Sept. 27
Alma	May 19	.....	Los Lunas	Apr. 9	.....
Arabela	Mar. 31	Nov. 3	Lower Penasco	Apr. 8	.....
Aztec	May 20	.....	Mesilla Park	Apr. 12	Oct. 26
Bluewater	May 24	Sept. 27	Olio	May 5	.....
Carlsbad	Mar. 31	Nov. 3[a]	Raton	May 23	Sept. 26
Cloudcroft	.....	Sept. 12[a]	Roswell	Mar. 31[a]	Nov. 3[a]
East Las Vegas	Apr. 3	.....	San Marcial	Apr. 1	.....
Engle	Apr. 21	.....	Santa Fe	May 20[a]	Nov. 3[a]
Folsom	May 23	Sept. 12[a]	Socorro	Mar. 31[a]	.....
Fort Bayard	Apr. 21	Oct. 3	Taos	May 21	Sept. 28
Fort Stanton	Apr. 30	Sept. 27[a]	Winsors	July 7	Sept. 2
Fort Union	May 23	Sept. 11	Woodbury	May 19	.....
Fort Wingate	May 21	Sept. 27	Eastview	May 20	Sept. 27[a]
Galisteo	Apr. 22	Oct. 4	Espanola	May 22	Do.
Gallinas Springs	Apr. 4	Oct. 27	Dorsey	.....	Sept. 12[a]

[a] Designated as last or first "killing frost" by observer.

CROP REVIEW, 1902.

Unusually fine weather during January, excepting the last week when a succession of storms brought cold, windy weather which, following the long dry spell, caused stock to fall of very rapidly, especially in all northern and eastern sections, excepting in the central and lower Pecos Valley, where moist snows during the latter part of the month compensated for the cold and previous drought. A timely fall of snow over Socorro County on the 17th, and over all northwestern counties on the 25th and 26th, relieved the drought conditions previously existing, and proved of the greatest value to the stock interests of that section. Owing to the storms of the last week the snow on the mountains about the headwaters of streams, although not as deep as usual, promised a fair supply of water for some weeks to come.

February was a warm, dry month, with high, desiccating winds during the last four days. Nearly all the precipitation of the month occurred from the 25th to the 28th, coming as snow in the northern counties and on the mountains, and as rain and thunderstorms in southern districts. The high winds of the last four days of the month were of unusual violence, causing much trouble and discomfort in the more exposed sections of the southern counties. As a rule stock passed the month in fair condition, but on account of the long dry spell had become very much reduced on many of the eastern and southern ranges, and in some instances loss was sustained. The storms of the last part of the month brought about the average amount of snow in the mountains, and was thought to assure a good water supply for the early spring months.

March was cool and dry with unusually high drying winds. The temperature averaged three degrees below normal, and precipitation nearly a third less than usual. At the close of the month the snow in the mountains was about the average excepting in the Canadian watershed and the eastern part of the Pecos watershed, and excepting in these districts the streams were fairly well supplied with water for the opening season. Considerable plowing and some planting had been done in southern sections, but in the northeastern counties spring work was delayed on account of the drought. The month was particularly disagreeable owing to the frequent high winds and dust and sand storms. Range stock passed the winter in very good condition, but owing to the dryness of the ranges there was considerable shrinkage during March, and some slight losses in eastern and northeastern counties. Apricots and some peaches were in full bloom in central and southern sections by the end of the month, and many of the buds were killed by the frosts of the 30th and 31st.

April was an unusually warm and dry month with high drying winds intensifying the drought. In the northeastern quadrant and in central counties irrigation water became scarce, spring seeding was delayed, and owing to the drying up of the ranges

there was considerable loss in stock, especially sheep and lambs. Equally unfavorable conditions obtained also in Rio Arriba County, where sheep men were experiencing heavy losses toward the close of the month. Elsewhere in the Territory irrigation water continued sufficient throughout the month, and in the south and southwest spring work and the growth of vegetation were deemed somewhat in advance of the usual season. Lambing also was turning out quite successfully. The ranges, however, were badly in need of moisture, and while stock generally remained in fair condition, owing to the favorable winter, there was not the improvement expected at this season.

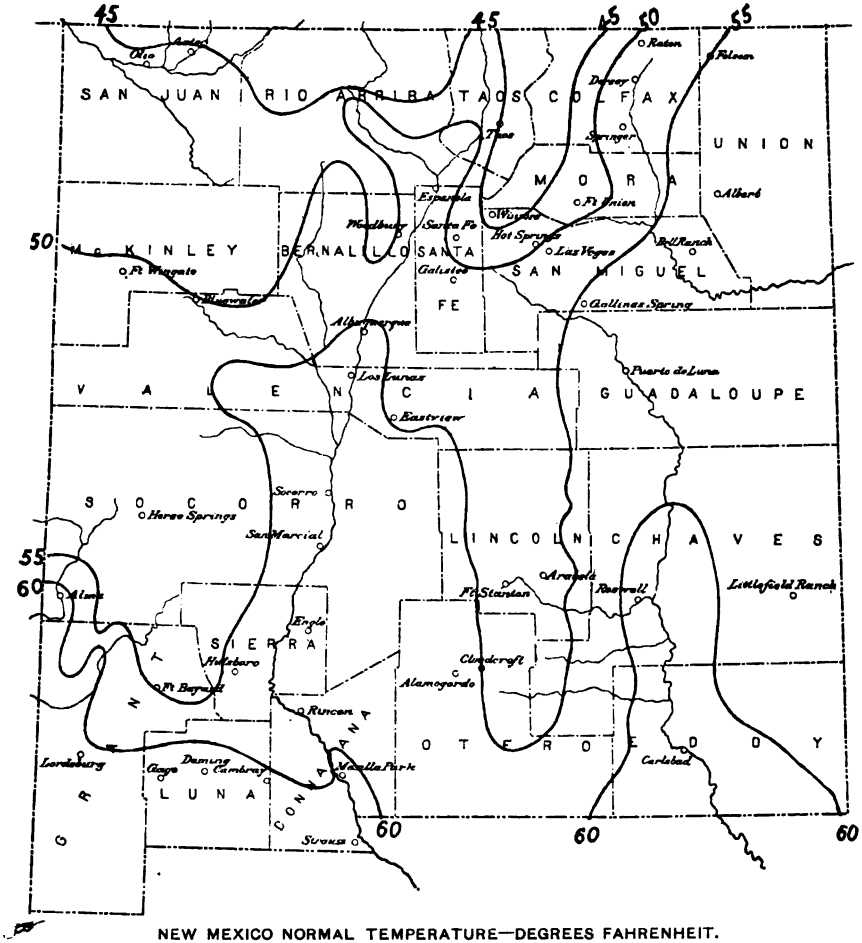
Prospects for an unusually large fruit yield remained promising, although a heavy frost on the 22d caused some alarm in the northern valleys. However, the effects of the slight freeze were beneficial in partially thinning the too heavily laden trees. Alfalfa, wheat, and oats, where irrigated, made good growth during the month. During the last ten days considerable corn was planted in northern counties, but on temporal, or unirrigated, land planters were waiting for rain.

May was a dry and windy month, the drought existing throughout April was not generally broken until the last week, when heavy rains over northern and northeastern sections brought relief. Except in northeastern counties irrigation water was sufficient during the month, and crops under ditch made fairly good progress. In the northeast, however, water was scarce, and on unirrigated lands very little planting could be done until after the rains of the 26th. The cold weather of the 19th and 20th brought frost over the northern half of the territory, with freezing temperatures in the northern valleys. Some early garden vegetables, young corn, and alfalfa were nipped, and early fruit slightly damaged, but the total injury was not extensive.

The continued drought in the east-central and northeastern sections caused large losses in sheep and lambs. Many old sheep died from the effects of the drought, and in many camps the increase in lambs was less than 50 per cent. Some outfits in northern counties secured as high as 85 per cent and over, but these cases were rare. The heavy rains of the 26th put the soil in condition for working, filled the prairie water holes, and started the grass on ranges, and at the close of the month farmers were busily engaged in planting their late crops of corn, beans, and pease, and cattle and sheep were beginning to show decided improvement. In the extreme southwest, where conditions were quite favorable during the lambing season of the early part of May, there was a very satisfactory increase, but toward the close of the month there was complaint of a serious drought affecting the cattle interests of these sections. At the close of the month the first crop of alfalfa was generally secured in southern counties, but with only a fair yield. The combined effects of the frosts of the 20th, the high winds, and the several severe local hail storms failed to lessen the general prospects of a large fruit crop.

June was an unusually warm and dry month, with high, drying winds. The precipitation was considerably less than half the usual June rainfall, and the high temperature, especially of the last decade, accompanied by almost daily wind storms, made the month one of severe drought, almost unprecedented in some localities. The only section having a rainfall approaching the normal was the southern Pecos Valley, and nearly all of this amount was the result of one storm decidedly local in character. From the 23d to the 26th, inclusive, was a period of warm weather unequaled in the records of the section. The highest temperatures recorded were 108° at Albert, 112° at Carlsbad, and 113° at San Marcial. Before the close of the month grass on the ranges was nearly all dried up and stock water was very scarce, particularly in certain prairie sections and on the Socorro County ranges, and stock interests as a whole, excepting in the lower Pecos country, were suffering severely. Irrigation water failed in many districts, the Rio Grande becoming dry from Albuquerque south. In the few sections having sufficient irrigation water the crops under ditch made only fair progress, while those lacking water suffered severely, and on temporal lands the small acreage of corn, pease, and beans that had been planted almost entirely dried up. Notwithstanding the fact that alfalfa stood the drought remarkably well, the second cutting was a very poor crop in nearly all central and southern sections. Cherries, apricots, and early peaches were ripening in the lower counties toward the first of the month, but the fruit was very generally undersized from the lack of moisture. At the close of the month the prospects were very discouraging for a large percentage of the crops on temporal lands and on lands under ditch where the water had failed, and on many of the central and southwestern ranges cattle were beginning to die from the lack of water and proper feed.

The existing drought continued, as a rule, during July over all sections excepting the southeastern quadrant, where the rainfall was far in excess of the normal. At Carlsbad, in the lower Pecos Valley, the total for the month was 10.51 inches, or



NEW MEXICO NORMAL TEMPERATURE—DEGREES FAHRENHEIT.

about 8 inches more than the usual amount. There was a number of light showers, and in some instances heavy rains during the month, especially the rain of the 19th over northern counties, but they were decidedly local in character and afforded only temporary relief on account of the dryness of the soil and the high winds. The storm of the 19th brought heavy rain and hail to northeastern sections, causing considerable damage from hail and floods in the vicinity of Watrous and Springer. At the close of the month conditions were excellent in southeastern sections, and fair in the upper mountain valleys, but on the plains in general the drought was severe, and while stock remained in fair condition still there was not the marked improvement expected at this season, and there was a lack of stock water on the prairie ranges and the grass was very short. Toward the close of the month wheat harvest began in the north-central valleys, and some was cut, both rather earlier than usual. Third alfalfa was about ready to cut in southern sections, and the second growth in northern, but both crops were considerably below the average. During the last decade corn made rapid progress where irrigated, but with a few exceptions the fields on temporal lands scarcely promised good fodder. A fine crop of cantaloupes was ripening in the lower Pecos Valley by the middle of the month, but it was expected that the watermelon crop of the Mesilla Valley would be a failure. The drought caused much dropping of fruits, and in some cases injury to the trees was reported. Grasshoppers were proving quite a pest in some localities of the northern Rio Grande Valley.

The temperature for August was about normal, with the precipitation for the Territory as a whole about a quarter more than usual. The excess of precipitation, however, was confined to the southern counties, while in northern and especially northeastern sections there was a deficiency. The protracted drought of central and southwestern counties, which was causing much alarm among the stockmen, was broken early in the month by general showers. Grass started rapidly on the ranges and the succeeding good rains of the month put ranges in excellent condition and gave every assurance of good fall and winter feed for stock. In the northern and especially northeastern counties the rains were insufficient and badly distributed, and in general the condition of the ranges was quite discouraging. There was practically no wild hay secured in northern counties, and there was little probability of the grass getting even a fair growth before the advent of killing frosts. Wheat, oats, and barley harvest was conducted in these districts under favorable conditions, but on unirrigated lands the several crops were very poor. Orchards and gardens, however, securing what water there was to spare, were unusually fine. In southern counties the later crops, as late fruits and alfalfa, corn and melons, improved greatly during the month. Apples, pears, plums, and late peaches were somewhat undersized in a few localities, owing to the long drought, but in general the late rains greatly improved the quality of these fruits and they were unusually excellent. Heavy rains visited the Black Range district on the 29th, causing a flood down the Mimbres River which almost completely devastated the beautiful Mimbres Valley. Orchards, crops, and homes were almost universally destroyed and the greater portion of the cultivated lands rendered waste by washing and the deposits of the flood.

September was a cold, dry month, with both temperature and precipitation far below normal. This was especially so in the extreme northeastern counties, where, on account of the slight rainfall during the entire season, the crops generally were failures and the ranges promised a shortage of winter feed for the stock. As a consequence, stockmen of the northeast viewed the approaching winter with alarm, and although at the close of the month all kinds of stock in these sections, in common with all parts of the Territory, were in very good condition, yet preparations were begun for removing possibly half of the cattle and sheep out of that portion of the country in order to save the ranges for the remaining stock. Water also became very scarce and only the best springs continued to flow. In other sections of the Territory, excepting a comparatively small area in the center, conditions were fair both for ranges and late crops, while in the lower Pecos, from above Roswell, the season was unusually favorable. The first damaging frost occurred in northern sections on the 12th, affecting slightly the colder northern valleys, and the next generally killing frost came on the 27th, causing damage to late beans, cucumbers, melons, and in some parts alfalfa throughout all northern counties.

October was characterized by steady, bright weather, with an absence of severe frosts excepting in the more exposed northern valleys and plains. The temperature was but slightly above the normal, while the precipitation was less than half the usual amount, occurring altogether on the first three and last three days of the month. Over the northern half of the Territory the drought conditions obtaining throughout the season continued during October, and while the absence of severe

frosts and the bright days were ideal conditions for curing the prairie grass, there was very little to cure on northern ranges, and stockmen reduced their flocks and herds to the minimum number on account of the scant feed. While water was very scarce on northern ranges, there are no reports of particular inconvenience or loss occasioned thereby. Throughout the season thus far the conditions for stock and crops have been very good in southern sections, and in the lower Pecos country particularly so. At the close of the month reports indicated that all kinds of stock were in very good condition. The first generally killing frost of the season over northern sections occurred on the 4th, but all crops were secured by this time, and the frost was not sufficiently severe to damage the prairie grass.

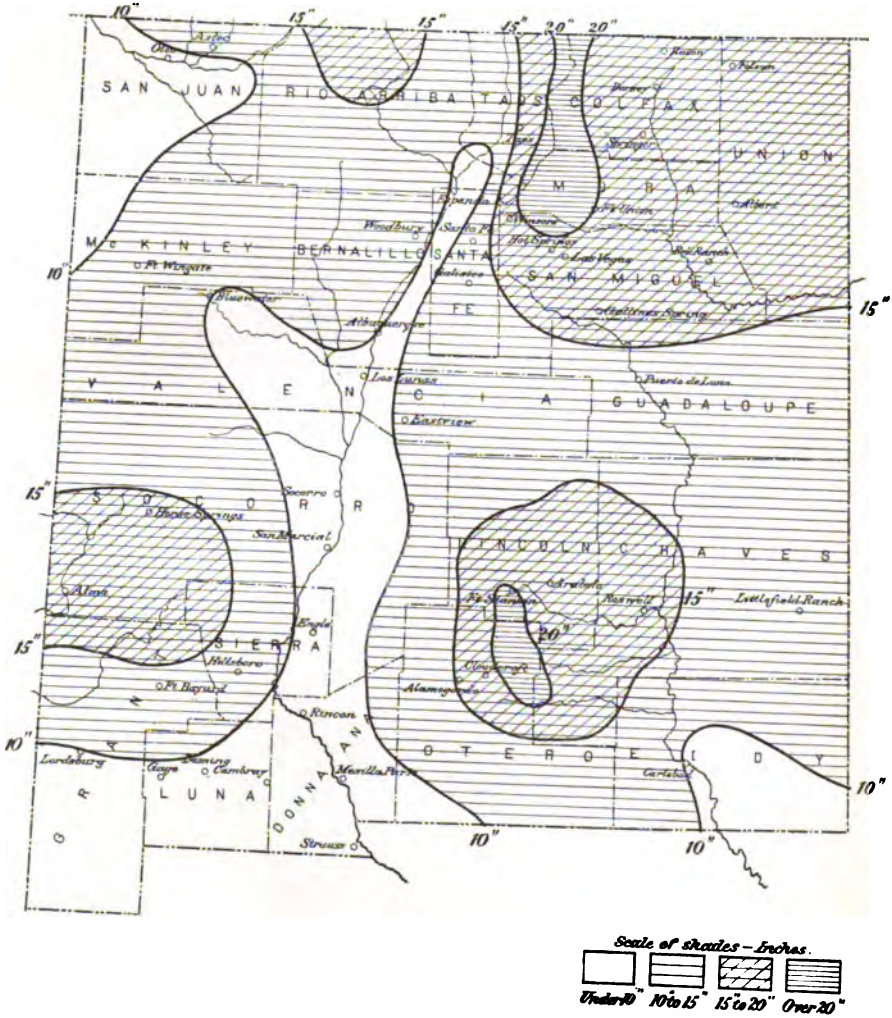
The prevailing drought of the season over northern sections continued during November, but over the Territory as a whole the precipitation was about normal, with the temperature slightly in excess. The month was characterized by pleasant weather, excepting the last few days, when extreme northern counties experienced rather severe weather for the season. The first generally killing frost occurred on the 3d, but as the prairie grass was well cured by this time no loss or damage was occasioned. The freezing weather of the last week of the month caused some inconvenience to northern stockmen by freezing up the shallow water holes and lakes; but over the Territory in general all stock was in very good condition at the close of the month, notwithstanding the scarcity of feed on northern ranges, as the fine fall weather had cured the grass into an excellent quality of feed.

December was characterized by steady, moderately cold weather, with the temperature half a degree above normal, and the precipitation 0.35 of an inch, or about half the usual amount, above normal. As a rule, this excess of precipitation was brought about by the general storm of the 12th, 13th, and 14th, which brought heavy snows to all northern counties, extending in a less degree as far south as the southern boundary as snow and rain, and proving of the greatest value to the stock ranges. On some northern mountain stock ranges the deep snow caused some slight loss, but on the whole the resultant benefit was far in excess. At the close of the month stock of all kinds were in very good condition, although on northeastern ranges the feed was quite scarce, but of a superior quality.

Annual summary of meteorological data, Santa Fe, N. Mex., 1902.

	Pressure.			Moisture.[a]				Wind.				Percentage of sunshine.
	Monthly mean.	Extremes.		Dew-point.		Relative humidity.		Average daily cloudiness, 0 to 10.	Average hourly velocity.	Maximum velocity.	Direction at time of maximum velocity.	Prevailing direction.	
		Maximum.	Minimum.	6 a. m.	6 p. m.	6 a. m.	6 p. m.						
January	23.23	23.51	22.81	16	21	60	55	3.5	5.9	38	S.	SE.	75
February	23.16	23.35	22.71	14	20	56	42	2.5	7.7	32	NW.	NW.	82
March	23.11	23.45	22.76	16	20	58	40	3.5	9.0	33	NW.	NW.	75
April	23.20	23.32	22.92	20	23	40	24	2.0	8.3	42	SW.	SW.	90
May	23.21	23.44	22.74	32	30	51	37	3.3	6.9	36	S.	SW.	79
June	23.26	23.46	23.05	34	29	39	20	1.5	7.3	28	SE.	SE.	93
July	23.35	23.56	23.10	42	36	54	27	3.2	6.5	33	NE.	SE.	78
August	23.37	23.50	23.19	45	43	62	37	3.5	5.6	25	SE.	SE.	78
September	23.33	23.52	23.08	38	36	63	37	2.1	6.1	25	NE.	SE.	86
October	23.33	23.47	23.06	25	26	51	35	2.2	5.0	24	E.	SE.	85
November	23.20	23.46	22.70	21	22	61	48	3.1	6.8	34	SE.	SE.	77
December	23.22	23.47	22.84	13	18	60	53	2.6	7.2	35	NW.	N.	82
Year	23.25	23.56	22.70	26	27	55	38	2.8	6.9	42	SW.	SE.	81

[a] Mountain time.



NEW MEXICO NORMAL PRECIPITATION FOR ALL YEARS.

Voluntary observers.

Stations.	Observers.	Stations.	Observers.
Alamogordo	J. C. Dunn.	Gallisteo	Sylvester Davis.
Albert	A. Knell.[a]	Gallinas Springs	Jas. E. Whitmore.
Albuquerque	Prof. M. Custers.[b]	Horse Springs	M. Stevens.
Alma	Wm. French.[c]	Las Vegas	Dr. W. C. Bailey.
Arabela	A. M. Richardson.	Las Vegas Hot Springs	Montezuma Hotel.
Aztec	E. G. Condit, M. D.[d]	Lordsburg	Agent Southern Pacific Railroad Co.
Bell Ranch	C. M. O'Donel.		
Bluewater	J. S. Van Doren.	Los Lunas	Richard Pohl.
Cambray	Agent Southern Pacific Railroad Co.	Lower Penasco	H. W. Cresswell, jr.
		Mesilla	New Mexico Agricultural College.
Carlsbad	H. F. Christian.		
Cloudcroft	A. Walker.	Olio	Cyril James Collyer.
Deming	Agent Southern Pacific Railroad Co.	Raton	A. R. Quick.
		Roswell	W. M. Reed.
Dorsey	W. C. Barnes.	San Marcial	J. K. Vencill.
East Las Vegas	J. W. Hanson.	Santa Fe	U. S. Weather Bureau.
Eastview	J. W. Corbett.	Silver City	Chas. H. Lyons.
Engle	A. J. Coats.	Socorro	Prof. F. A. Jones.
Espanola	Jim Curry.	Strauss	Agent Southern Pacific Railroad Co.
Folsom	Jackson Tabor.		
Fort Bayard	Surgeon in charge.	Taos	Frank Staplin.
Fort Stanton	Do.	Winsors	H. D. Winsor.
Fort Union	M. C. Needham.	Woodbury	A. J. Woodbury.
Fort Wingate	Post surgeon.		
Gage	Agent Southern Pacific Railroad Co.		

[a] H. M. Hanson after January.
[b] Prof. C. E. Hodgin after May.
[c] Maurice Coats after May.
[d] L. C. Grove after February.

Forecast display stations.

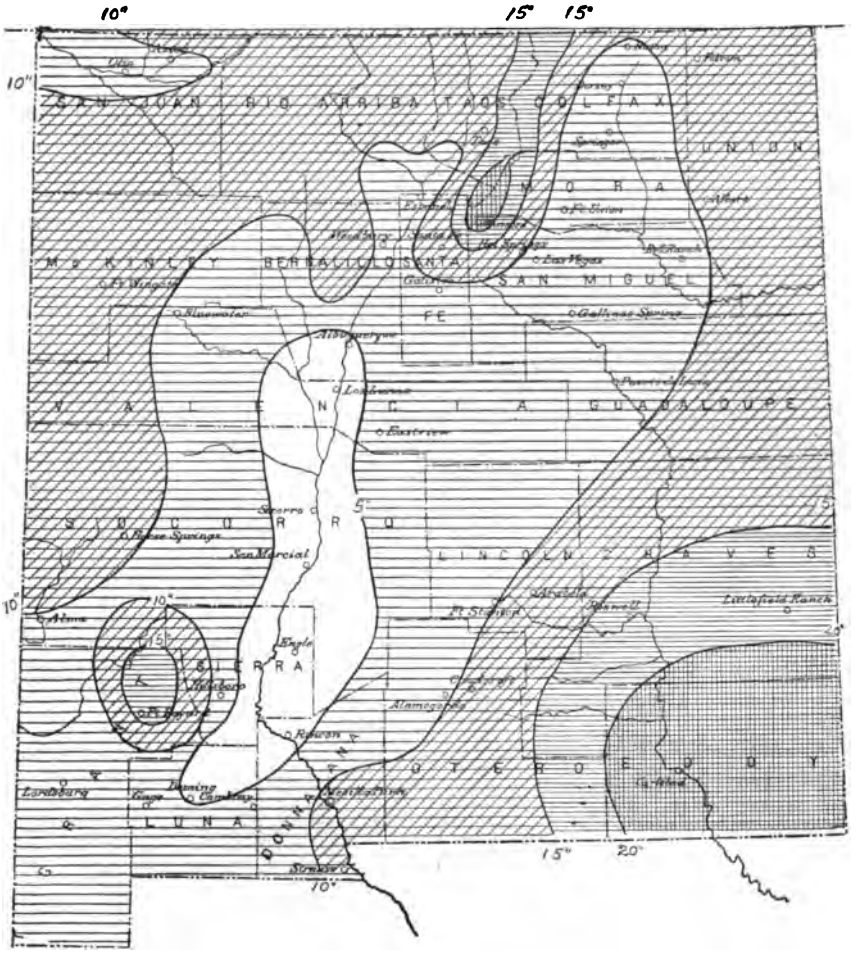
[Distributing center, Denver, Colo.]

Stations.	Displaymen.	Stations.	Displaymen.
Albuquerque	Postmaster.	Las Vegas	Plaza Hotel.
Raton	A. L. Hobbs.	Las Vegas Hot Springs.	Montezuma Hotel.

NOTE.—Special warnings telegraphed to J. F. Hutchinson, Springer, and Ross McMillan, Socorro, and "emergency warnings" to 36 postmasters in the Territory.

Climatological data for the year 1902.

Stations.	Counties.	Elevation.	Temperature.						Precipitation.							Number rainy days.	Sky.			Prevailing direction of wind.
			Length of record.	Annual mean.	Highest.	Date.	Lowest.	Date.	Length of record.	Total for the year.	Greatest monthly.	Month.	Least monthly.	Month.	Total snow fall.		Number clear days.	Number partly cloudy days.	Number cloudy days.	
		Feet.	*Yrs.*	° *F.*	° *F.*		° *F.*		*Yrs.*	*In.*	*In.*		*In.*		*In.*					
Alamogordo	Otero	4,300	1	61.8	108	June 24	13	Dec. 29	1	7.25	3.39	August	0	April	T.	29	244	104	17	SW.
Albert	Union	4,700	13	58.1	108	do	1	Jan. 26	13	11.16	3.76	May	0	February	8.5	29	240	83	42	SW.
Albuquerque	Bernalillo	5,200	28	56.8	100	do	12	(*a*)	28	4.94	1.20	July	0	April	3.2	18	251	95	19	S.
Alma	Socorro	5,500	9						9											
Arabela	Lincoln	5,800	1						1											
Aztec	San Juan	5,590	8						8											
Bell Ranch	San Miguel								3	8.71	2.38	August	T.	February	3.2	29	188	146	31	SW.
Bluewater	Valencia	6,200	7	48.2	108	June 24	−12	Feb. 2	7	7.05	3.00	do	T.	(*b*)	27.5	31	206	49	110	W.
Cambray	Luna	4,221							3	6.64	1.72	do	0	(*c*)	2.0	35	174	54	137	W.
Carlsbad	Eddy	3,121	8	65.0	112	June 25	13	Feb. 2	8	22.42	10.50	July	0	February	5.7	31	282	62	21	W.
Cloudcroft	Otero	8,650	1				− 2	Jan. 31	1						60.8					
Deming	Luna	4,331							19	4.66	1.61	August	0	(*d*)	T.	26	263	14	88	W.
Dorsey	Colfax		1						1											
East Las Vegas	San Miguel	6,450	14						14											
Eastview	Valencia	7,000	1						1											
Engle	Sierra	4,750	8						8											
Espanola	Santa Fe	5,590	7						7											
Folsom	Union	6,000	5	48.7	94	June 24	− 7	Jan. 22	5	12.47	3.82	May	0.14	April	36.7	53	199	153	13	SW.
Fort Bayard	Grant	6,040	28	55.5	98	do	15	Jan. 30	28	15.67	7.13	August	0	do	2.1	52	264	64	37	SW.
Fort Stanton	Lincoln	6,151	1	51.9	105	June 26	5	Nov. 26	1	9.94	2.28	July	0	do	11.2	45	279	53	33	W.
Fort Union	Moro	6,835	44	50.3	95	June 23	− 6	Dec. 15	44	9.89	3.05	August	T.	February	17.0	41	275	68	22	W.
Fort Wingate	McKinley	6,649	39	50.3	95	Aug. 1	− 4	Jan. 27	39	12.37	1.95	January	T.	June	58.3	67	230	64	71	SW.
Gage	Luna	4,480							3	8.03	3.02	August	0	(*e*)	T.	25	255	60	50	E.
Gallisteo	Santa Fe	6,074	9		96	Aug. 8			9		2.14	May	0	(*f*)						W.
Gallinas Springs	San Miguel	5,272	18	56.0	105	June 23	− 6	Dec. 16	18	8.06	2.52	July	T.	April	12.0	48	190	102	73	SW.
Horne Springs	Socorro	7,045	1						1											
Las Vegas	San Miguel	6,384	1	51.7	98	June 23	− 9	Dec. 16	1	9.78	1.95	May	.01	March	15.5	53	286	64	15	W.
Las Vegas Hot Springs	do	6,767	4		94	June 24	2	(*g*)	4		1.85	July	0	April						
Lordsburg	Grant	4,245							19	5.57	2.25	August	0	(*h*)	T.	23	259	45	61	W.
Los Lunas	Valencia	4,900	7						7											
Lower Penasco	Chaves	5,250	6						6											
Mesilla Park	Doña Ana	3,500	15	60.8	106	June 24	13	Nov. 27	15	10.90	5.77	August	0	April	5.0	39	251	65	49	W.



Scale in inches.

CHART SHOWING TOTAL PRECIPITATION FOR 1902.

Olio	San Juan	4,800	6		110	July 25			6										
Raton	Colfax	6,622	8	51.2	98	(a)	− 2	Jan. 27	8	8.14	3.50	August	0	October	22.7	31	192	73	101	SW.
Roswell	Chaves	3,570	9	59.5	107	June 25	10	....do...	9	16.58	5.52	July	0	February	6.7	38	221	85	59	SW.
San Marcial	Socorro	4,554	7						10											
Santa Fe	Santa Fe	7,013	25	50.2	91	Aug. 4	8	Feb. 2	25	13.36	2.84	May	.02	April ...	24.9	78	243	97	25	SE.
Silver City	Grant	5,851																		
Socorro	Socorro	4,600	13						13											
Springer	Colfax	5,857	7						7											
Strauss	Doña Ana	4,080							3											
Taos	Taos	6,983	1	49.3	100	July 30	−10	Jan. 27	1	10.75	2.57	August .	T.	(f)	31.0	33	247	102	16	SW.
Winsors	San Miguel	8,000	6	42.4	87	June 24	− 8	Dec. 15	8	20.66	3.97	....do...	.14	April ...	52.0	65	205	69	71	W.
Woodbury	Bernalillo		1						1											

[a] Feb. 2 and Dec. 16.
[b] Apr., June, July, Oct.
[c] Jan., Apr.
[d] Apr., June.
[e] Jan., Mar., Apr., May.
[f] Apr., June.
[g] Jan. 27 and Dec. 15.
[h] Apr., May.
[i] May 5 and July 30.
[j] Apr., June.

THE JICARILLA APACHE AGENCY.

H. H. JOHNSON, *Superintendent.*

A careful census of the tribe shows a population of 774, divided as follows: Male, 373; female, 401; of whom 215 are children of school age. This shows an apparent decrease of 27 during the year, but I feel convinced that such is not the case, as there were quite a number of people shown on last year's census who had been dead for as much as two years. It is my judgment that the number shown on the census roll herewith submitted is not far from what should have been shown on the census for the year of 1902.

In this connection I desire to mention that the present census shows, in so far as was possible, the names of the Indians as they appear on the allotment schedule. It was difficult to compile an intelligent census for the reason that the members of the tribe have not been compelled to retain the names by which they were allotted, but were either enrolled by a "nick name" or given an arbitrary name each time the census was taken. Notwithstanding the effort put forth, I can not be certain that the present census is absolutely correct, but I feel sure that in another year a census can be compiled which can be relied upon. As it is the custom of this tribe to wait until a child is about 3 years of age before giving a name, it was thought best not to assign an arbitrary name, which the parent will not remember, as endless confusion will result. On this account children under 3 years of age are simply enrolled with the parent by giving the sex and age.

As a natural consequence of the above-mentioned confusion of names, the very important matter of Indian allotments is in a more or less chaotic state. By actual count, there are 205 individuals on the census roll who certainly have allotments (judging by their evident age), but who can not be identified with their names on the allotment schedule. It would be possible, by careful and patient work, to finally straighten out this tangle were it not for the fact that very many of the allottees have not the remotest idea of the location of their allotments. In view of the difficulties presented as to the lands of living allottees, it can be readily foreseen that it will be a well-nigh hopeless task to locate lands of deceased allottees and to determine the heirs to such lands.

In view of the above, and also considering the fact that it will not be possible to make all the allotments tillable (as a large percentage of them can never be irrigated), I am lead to earnestly recommend that when the present policy of building storage reservoirs has been sufficiently pursued that there will be ten acres of irrigated land for each member of the tribe; then the necessary steps be taken to effect a cancellation of the present allotments and that a new allotment be made, giving each allottee a small tract of irrigated land, the remainder of the reservation to be held in common as grazing land. I have presented this idea to a number of the leading men of the tribe, and it meets their hearty approval. I feel confident that the consent of the tribe can be obtained to a reallotment on such a basis.

On account of the severe drought, absolutely nothing was raised by the tribe last year. Last April there were issued to the tribe 10,000 pounds of seed wheat, 10,000 pounds of oats, and a like amount of seed potatoes. As the season has proven favorable, a good return from the planting of this seed can be confidently predicted. In fact, the wheat and oats are now almost ready for harvesting. The tribe will also have a good crop of hay, much of which is already cut and stacked.

When I assumed charge of this agency, every member of the tribe was allowed to participate in the rations distributed. Agency employees (Indian) who were receiving salaries of $60 per month were allowed the same share as those unable to work. This practice was discontinued, and the number allowed rations gradually decreased until, at present, the ration roll carries 309 persons. The merits of each individual case have been carefully investigated and the rations are now distributed solely to families where the head of the family is absolutely incapacitated from earning a living. When the training school is opened for pupils this number will be mate-

rially decreased, as there are quite a number of children of school age in the families now on the ration roll.

That the issuing of rations to the whole tribe is neither necessary nor prudent is evidenced by the fact that a conservative estimate of money earned by the tribe will show $15,000 during the past year. This money was derived from the following sources: Paid by the Government for work on reservoirs, ditches, and roads, $10,000; earned by labor on neighboring ranches, $2,000; proceeds of sales of baskets, beadwork, etc., $3,000.

If the present policy of paying for labor in lieu of issuing rations is continued for a few years I feel assured that the Jicarilla Apaches can be placed in such a position that they will no longer be dependent on the bounty of the Government. The money being spent, as now, in the building of storage reservoirs will enable the tribe to have an assured means of support through the tilling of the soil.

The work accomplished during the past year is represented by two large reservoirs. One of these reservoirs will hold sufficient water to irrigate 2,000 acres of excellent land, which amount can be easily reached by the water thus stored. The second reservoir should easily serve the 1,000 acres tributary thereto, although about 250 acres of the latter is property belonging to the agency and school.

If present plans do not miscarry there will be about 2,500 acres more "placed under the ditch" during the present working season.

During the year over 3 miles of road has been constructed. This road was built at points where travel was difficult and represents a large amount of hard work. In addition, a considerable amount of repair work was done. It is my purpose, if means will permit, to construct a good road from each irrigation district to the agency, which is the shipping point for all reservation products. If a first-class road grader were provided for this agency, the labor and expense of road building would be very materially reduced.

Referring to the live-stock interests of this reservation, I desire to state that cattle in considerable numbers can not be produced, on account of the extremely rough character of a large part of the lands available for grazing. Sheep, however, will thrive admirably in such pastures, and, moreover, the members of this tribe are more adapted to successfully care for sheep than for cattle. When irrigation farming is firmly established at this place, and when a considerable amount of alfalfa is produced, I would recommend that a portion of the timber on this reservation be disposed of (under proper restrictions) and the proceeds be invested in sheep for distribution among the energetic and deserving of the tribe. A few of the more enterprising members of the tribe have already started in the sheep industry in a small way and are attaining a fair measure of success. There are about 2,000 head of sheep and a like number of goats owned by the Indians.

The greatest enterprise exhibited by this tribe is in the matter of raising ponies, there being at least 2,500 head on the reservation, notwithstanding the fact that a large number succumbed to the rigor of the past winter. This pony stock is not improving in quality. The Indians persist in the use of pony stallions for breeding purposes and will continue to do so until effective measures are inaugurated to prevent it. As a means of improving the work animals owned by the Indians, I would recommend a yearly "round-up" of all horses and the castration of all male colts. I would then introduce for the use of the tribe a few well-bred stallions and a sufficient number of well-bred jacks. Mules are decidedly preferable to horses for the use of the Indians, as they are more rugged and hardy.

One of the most important questions relating to this reservation, which must be dealt with in the near future, is the disposition of the fine bodies of timber growing at various points within the reservation lines. In my judgment there should be no haste in the matter, as the timber is growing more valuable with each passing year. When the time arrives that sales seem expedient I most earnestly recommend and urge that the utmost care be used in surrounding this sale with every possible safeguard against wanton destruction. The amount of timber destroyed by the lumber companies in this vicinity can scarcely be realized. There are tracts of timber land within a day's drive of this agency where thousands of trees have been felled, only the choicest logs being made use of and the remainder left to rot on the ground.

The greatest stumbling block in the path of the Jicarilla Apaches has been the ease with which they could obtain liquor. A certain wealthy Mexican owns 5 saloons on the borders of the reservation and for fifteen years has debauched this tribe in defiance of the law. Last April I succeeded in securing a conviction of this man, and although he claims to be one of the wealthiest men in New Mexico, he was obliged to spend sixty days in the Federal jail as a common criminal. It is a significant fact that there has not been a case of drunkenness on this reservation since the conviction mentioned above.

The most pressing need at the agency is a good water system. At moderate cost the school water system could be extended to the agency. This should be done as a protection against fire as well as for irrigation and domestic use.

The training school for this tribe is not in operation, owing to the failure of the reservoir first built for the storage of water. A new reservoir was built a short time ago which has proven a success, and the school will be opened September 1.

There are about 160 acres of excellent land tributary to the school, all of which can be irrigated by the school pumping plant.

The school plant is very good, but will probably be too small to accommodate 215 children, which the last census shows to be of school age. The construction of a separate school building and assembly hall would probably relieve the other buildings so that all able-bodied children of school age can be accommodated. The school should also have a good and commodious barn as a part of the plant.

THE MESCALERO INDIAN AGENCY.

JAMES A. CARROLL, *Superintendent.*

Statistics accompanying annual report for fiscal year 1903.

1. Name of agency, Mescalero.
2. Name of Indian tribe, Mescalero Apache.
3. Population of tribe, 439.
   (*a*) Males, 184.
   (*b*) Females, 255.
4. Number of Indians who wear citizen's dress wholly, 439.
5. Number of Indians who can read, 155.
6. Number of Indians who can use English enough for ordinary intercourse, 183.
7. Number of Indian children of school age, 107.
   (*a*) Males, 48.
   (*b*) Females, 59.
8. Number of dwelling houses occupied by Indians, 62.
9. Proportion of the subsistence of Indians obtained:
   (*a*) By labor of Indians for themselves, 92 per cent.
   (*b*) By issue of Government rations, 8 per cent.
10. Number of missionaries, none.
11. Number of formal marriages among Indians during year, 5.
12. Number of births, 21.
13. Number of deaths, 30.
14. Number of Indian criminals punished during the year, none.
15. Number of acres cultivated during the year—
   (*a*) By Government, 62.
   (*b*) By Indians, 1,000.
16. Number of acres broken during the year, 123.
17. Number of acres under fence, 2,700.
18. Feet of lumber sawed on reservation, 67,433.
19. Feet of timber marketed by Indians, 100,000.
20. Cords of wood cut by Indians, 165.
21. Number of pounds of freight transported by Indians, 154,519.
22. Amount earned by such freightage, $309.
23. Value of products of Indian labor sold to Government, $1,462.50.
24. Value of products of Indian labor sold otherwise, $4,767.89.
25. Produce raised:

	By Government.[a]	By Indians.[a]
Wheat ..... bushels..	None.	4,000
Oats ..... do....	100	8,000
Corn ..... do....	None.	200
Potatoes ..... do....	200	1,600
Turnips ..... do....	50	None.
Onions ..... do....	50	250
Beans ..... pounds..	None.	10,000
Other vegatables ..... do....	5,000	5,000
Hay, cut ..... tons..	20	25

26. Stock owned:

	By Government.[a]	By Indians.[a]
Horses ..... number..	14	1,000
Mules ..... do....	None.	40
Burros ..... do....	None.	100
Cattle ..... do....	39	None.
Swine ..... do....	11	None.
Sheep ..... do....	70	6,405
Goats ..... do....	None.	1,742

[a] Estimated.

Cash income of the Mescalero Apache for fiscal year 1903.

Received from Government:		
Sale of 50,000 pounds oats	$750.00	
Sale of 165 cords wood	412.50	
Sale of 100,000 feet timber	300.00	
Transportation of supplies	309.00	
Transportation of lumber	144.36	
Work on irrigation ditches	822.50	
Work developing springs	457.50	
		$3,195.86
Received from other sources:		
Per capita payment from proceeds of grazing	2,760.00	
Sale of wool	2,128.40	
Sale of farm and ranch products	764.49	
Sale of curios	1,875.00	
Labor performed for permittees and others	500.00	
		8,027.89
Total income		11,223.75

Per capita income, $25.56.

The census of June 30 last shows a population of 439, as follows:

Males 18 years and over	106
Females 14 years and over	160
Males under 18 years	78
Females under 14 years	95
Total	439
Children between 6 and 16	101

The office has so often been advised as to the physical conditions, topography, and area of the lands which constitute the common heritage of the Mescalero Apache that it is deemed unnecessary to devote any space to this subject.

The report that a number of Mescalero Apache—a remnant of Victorio's band—were living in the Republic of Mexico, allusion to which was made in the annual report for 1902, was investigated and verified, although the actual number was found to be 37 instead of 107. Three members of the tribe were permitted to visit the Republic last year with a view to obtaining information as to the location, general condition, and pursuits of their relatives. They found them occupying a narrow canyon in the Guadalupe Mountains, about 20 miles east of Zaragoza, a station on the Mexican Central Railroad. They were in wretched circumstances, having to depend almost entirely on game and herbs and the sale of curios. They were anxious to remove to this reservation, and requested their friends to convey such a message to this office. Accordingly the facts were presented in letter of May 25 last, with the recommendation that measures be instituted to effect the return of the wanderers. This recommendation failed to meet with the approval of the office and the status of the unfortunates must remain unchanged. Although the incident is considered closed, it must be refreshing to the office to know that, while members of other tribes in the United States are seeking to dispose of their lands and personal property and to remove to Mexico, others who have lived in that Republic for years are ready to emigrate and swear allegiance to the United States.

The agricultural lands of the reservation are limited in area, being confined to narrow canyons; but the soil, which has been formed throughout centuries from the erosion of the mountains, is deep, exceedingly fertile, and apparently inexhaustible. It is admirably adapted to small grain, potatoes, beans, and all kinds of vegetables. With a knowledge of these facts and an abiding conviction that the hope of the Indian, at least under conditions that obtain here, lies in agricultural pursuits, it has been the constant aim of this office to encourage the tribe to greater activity along these lines. The measure of success attained may be best illustrated by a comparative statement showing the number of pounds of oats produced during each year for the past five years, oats having always been considered the principal crop. The statement is taken from the annual reports of the Honorable Commissioner of Indian Affairs, and is as follows:

Year.	Oats.	Year.	Oats.
	Pounds.		*Pounds.*
1898	(a)	1901	50,000
1899	28,544	1902	123,758
1900	50,016		

a Not reported.

The statistical report for 1902 estimated the oat yield for that year at 2,800 bushels or 90,000 pounds. Every pound was weighed, however, as it came from the separator, and the actual yield, as shown by a sworn weigher's return, was 123,758 pounds. Of this amount 35,000 pounds were reserved for seed, the remainder being sold to the Government and to private parties. The Indians, many of them at least, objected to the arbitrary action of this office in reserving the seed, but subsequently expressed their approbation. They had acquired the habit of selling the entire crop at a price ranging from $1.25 to $1.50 per hundredweight and then purchasing seed the following spring at from $2 to $2.10 per hundredweight. Frequently many of them had neither money nor credit; hence no oats were planted. It was to guard against such contingencies that this office reserved the seed. The wisdom of this course will be demonstrated when the crop of 1903 is harvested. While the season has not been favorable, this owing to the scarcity of rain, the farmer estimates the oat crop at 250,000 pounds, more than double that of 1902 and exceeding the aggregate of any five-year period prior to 1902. The past year has also demonstrated that wheat, potatoes, onions, and beans can be profitably grown. Two hundred acres were sown to wheat, 9 acres of potatoes were planted, 1 acre of onions, and 20 acres of beans. As an evidence of the success of these experiments, it may be said that the Indians have the contract for furnishing the flour and beans called for on the annual estimates for the current fiscal year, thus increasing their income by $1,000 as well as providing many of them with subsistence supplies that they have heretofore been obliged to purchase. The wheat crop, which is now being harvested, will amount to at least 4,000 bushels, or twenty times as much as was ever produced in any previous year.

The purpose of this office is to reapportion the farming lands on the basis of a given per capita acreage; to build a comfortable frame house for each family, with outhouse for wagon and team; induce the Indians to sell their numerous worthless ponies, investing the proceeds in cows, and encourage them to plant a variety of garden truck in addition to their oat and wheat crops. All this can be accomplished within the next two years provided the sawmill is properly equipped.

The sheep industry was considerably improved during the past year by concentrating the small flocks that were gradually decreasing, either being eaten or dying through improper care, and placing them under the management of some one of the few Indians who have demonstrated their ability and adaptability for pastoral pursuits, and under an arrangement that gave the latter all the wool and one-tenth of the increase. In this way have many of the small flocks that were doomed to early extinction been preserved, and those Indians who were pretending to farm and herd sheep, but without profit from either industry, have been required to devote their entire time to agriculture or to such work as the Government or private parties could offer them. The purchase of 40 thoroughbred rams has contributed to improve the various herds. Last spring's lambs are half-breed Shropshires and half-breed Rambouillets, large and strong and a much better grade than the best Spanish Merino. The Indians have the contract for furnishing 20,000 pounds of mutton for the school for the current fiscal year. The wool clip for 1903 amounted to 15,100 pounds and was disposed of by this office at 13 cents per pound.

It is quite evident to one who studies sheep-raising that to make a success a man must possess attainments above the ordinary. There are so many details of management to be closely watched and so many disastrous contingencies to be guarded against that the man of mediocre ability should follow a different pursuit. It is impracticable to make all Indians sheep raisers. Only a few of this tribe, possibly five, have made any success, and these will eventually control the industry.

The grazing permit system of pasturage, which was inaugurated in March, 1902, furnished a revenue of $7,605.45 during the first year. The income from this source for the current calendar year will be approximately $8,000. Considerably less than half of this fund has been distributed per capita, the remainder being employed in the purchase of thoroughbred rams, wagons, harness, plows, disks, seed drills, and wheat, onion sets, potatoes, and beans for planting. The fund should be further used in drilling wells throughout certain dry townships, erecting dwellings, and in

the construction, equipment, and maintenance of a home for the old and infirm, but these recommendations will form the subject of special communications.

During the past year the labor permit system was inaugurated to a limited extent. These contracts have been made for and on behalf of certain old and indigent Indian women on the basis of part of the crop. Anticipating some revenue from this source, a recommendation was made that subsistence supplies for the old Indians be reduced 33⅓ per cent.

Among the substantial improvements begun during the year may be mentioned three cottages for agency employees and four for the Indian police and laborers. None of these buildings have as yet been completed, because the inefficiency of the engine and boiler and log wagons at the sawmill made it impossible to manufacture the material.

Both coal and copper were discovered on the reservation during the past year. Silver was discovered several years ago. As it was never the intention of the Government to reserve mineral lands for Indian occupancy, it appears to this office as just and right to the Indians, as well as the public, that prospecting permits should be issued, under certain regulations, and, in case minerals are found in sufficiently paying quantities, that mining permits be issued on the basis of a small royalty for the Indians. Unless this is done it is quite probable that a considerable part of the reservation will eventually be cut off in order to satisfy the demands of persons who believe precious minerals exist here, thus depriving the Indians of a possible royalty as well as extinguishing their right of occupancy to some of the most valuable grazing lands in the United States.

The Mescalero School still enjoys the unique distinction of showing an attendance exceeding 100 per cent of the scholastic population. Runaways and expulsions are unknown. This must not be attributed to a thirst for knowledge, but rather to a longing for something to eat and wear. The Indians have been on a starvation basis for years. They have subsisted largely on game, pinon nuts, mescal fruit, and by slaughtering stock of sheepmen and cattlemen whose herds were trespassing on the reservation. Many of them have suffered from hunger and cold and have been more than willing to see their children provided with the necessities of life.

Work in all departments of the school was conducted in an intelligent and satisfactory manner. While the course of study could not be adopted in its entirety, the essential ideas were followed and with manifestly good results. Especial attention was devoted to industrial training, an effort being made to adapt this to the environment of the pupils' homes. Literary training is essential—a pupil should acquire the rudiments—but it is through practical work that the Indian child must be equipped to meet life's duties successfully and to become a self-sustaining and contented citizen.

A telephone line from the school to Tularosa station, a laundry, and an employees' quarters were the only improvements authorized at the school during the past year. The first was completed, placing this office in direct communication with the Postal Telegraph Cable Company, and, by connecting with the Alamo Telephone Company's line in Tularosa, with the following points: Tularosa, La Luz, Cloudcroft, Alamogordo, N. Mex., and Fort Bliss and El Paso, Tex. The laundry was not completed for the reason that the lumber could not be manufactured. Work on the employees' quarters was not commenced for the reason that the authority for this building was not granted until June 12 last. The dormitories, dining hall, laundry, and all employees' quarters were condemned by Supervisor Dickson in May last. It is to be presumed, therefore, that bids will be invited by the Office at an early date for the construction of new buildings. With these contemplated improvements, the installation of an efficient water and sewage system, the destruction of the wretched old rookeries in which the pupils and employees have been housed, and some attention given to grading and landscape gardening, Mescalero will easily become the prettiest place in the service.

The mortality among the pupils, as well as among the Indians, was excessive, being attributable in almost every instance to tuberculosis. The physician's special report on this subject, submitted under date of the 31st ultimo, should convince the Office of the wisdom of providing a small hospital where sufferers from this malady can be given proper hygienic and dietetic treatment.

Hon. Estelle Reel visited the school in February, and Hon. Charles H. Dickson in May. If the reports of these officials indicate that affairs have been conducted in a creditable manner, the measure of success must be attributed to the continued support of the honorable Commissioner of Indian Affairs and to the thorough cooperation of efficient, faithful employees.

THE NAVAHO AGENCY.

G. W. HAYZLETT, *Indian agent.*

The Navaho Agency is located at Fort Defiance, Ariz., 30 miles northwest of the town of Gallup, N. Mex., which is our nearest railroad and telegraphic station. There is a daily stage, except Sundays, carrying the mails and any passengers.

GENERAL CONDITIONS.

The progress of the Navaho Indians for the past year has been steady and of a lasting nature. Their material advancement and progress could not be seen so readily, perhaps, by a person making only a short stay among these Indians or traveling over their reservation, but it can easily be observed by one who has been with them five years and been in close touch with them and watched their interest as he would that of a brother, and directed their well-meant efforts and struggles for self-support. As a rule, I believe, the Navaho does not readily adopt the white man's mode of education as gleaned from books. He likes the free and untrammeled life of the children of the plains; but he is a skillful workman and is able to learn any of the mechanical arts. Their work as blanket weavers and silversmiths is well known throughout the country. These arts they have taken up themselves. Almost any Navaho could be taught blacksmithing, carpentry, masonry, and the like, and they would excel in these lines. There are some excellent stone masons among these Indians who have been self-taught only. Almost any of these Indians are able to do any kind of unskilled labor, such as railroading, cultivation of the sugar beet, and all kinds of farm labor. They are all good and willing workers. When I have had any irregular labor for the Indians I have had no trouble in securing more of them to work than I could use.

The greater extent of this large reservation is fit for grazing only, and during the past year, on account of continued drought, it has been little more than a barren desert. There are quite a number of small farms scattered over the reservation, but on account of lack of seasonable rains, some were not even planted and the product was very small. Notwithstanding these unfavorable conditions they have managed to live, and that without any apparent suffering and with little help from the Government in the way of issuing rations to them.

The rainfall on this reservation during the last spring and early summer was greater than has been known for the past eighteen years. The crops at present look promising, indeed. The grass on the mountains and in the valleys is abundant. The sheep, cattle, and other stock are doing well. Some of the Indians have cut and put up a good quantity of native hay, some of which they have sold to the Government, traders, and missionaries. They would, doubtless, have put up more hay than they did, but only a few of them had scythes and small sickles.

These Indians are, as a rule, peaceable and law abiding, yet some of them are continually in trouble with each other relative to their lands, fields, water, stock, etc. There are also a great many cases of trouble between husband and wife. These people seem to be unable to settle difficulties among themselves, but must bring their troubles to me. After I hear both sides and give a decision there is no further trouble in the matter. They usually accept the decision without murmur and as final.

EARNINGS.

It has been my policy to induce all able-bodied Indians—those who have no fixed homes and those who are not needed at their homes to plant and attend their crops, look after their stock, and take care of families—to secure work off the reservation. During the past year about 300 Indians have had work off the reservation, principally with the Santa Fe Pacific Railroad Company, and have earned about $1.10 per day. I tried to induce more to seek employment, but as there was abundant rain during

the early spring many who otherwise would have gone desired to stay at home and plant crops.

From the time I took charge of this agency, five years ago, I have advised them to not sell their wool, but to manufacture it into blankets, showing them that as an average price they would receive for their wool on the market $2 for 20 pounds of wool, but when manufactured into a blanket it would bring them from $8 to $12, thus creating labor, the most natural and successful civilizer the world has ever known.

The Indians have, during the past fiscal year, earned $16,323.87 by working for or furnishing supplies for the Government.

The receipts from sale of blankets, wool, and stock must aggregate at least $500,000.

The stock increase, so far as sheep are concerned, has been at least 30 per cent. I know of one Indian who saved 1,900 lambs this spring; in fact, they all report a good lamb crop with but little loss. I attribute this result largely to my efforts from the time I took charge of these people. Their custom was to allow their bucks to be herded with the general flocks, thus bringing the lambs at a very unseasonable time of year, often in winter in deep snows or bad weather in early spring, causing heavy loss. They are fast changing their former custom, which now brings the young lambs in May and early June.

Some of these people are quite wealthy, owning flocks of sheep numbering all the way from a few dozen up to many thousands. I dare say there are some Navahos who are worth from $3,000 to $8,000. Many are poor and always will be, but none of them have ever been known to starve. Last fall there was much said in the newspapers about the "starving Navahos," but to the present time I know of none of them having starved.

I have known from the time I arrived here that the tribe had a great many worthless horses and used my best endeavors to have them disposed of, but it seemed impossible for the Indians to sell them. These Indians have always used horseflesh more or less instead of beef or mutton. Late last fall and in the early winter I sent out an order to those who claimed to be hungry to go into the herds of horses where they were wild and unbroken and kill and eat without reference to whom they belonged. In doing this I expected more or less trouble, but felt fully competent to manage the Indians in a kind manner by explaining all the features connected with their hungry brethren and their overstock of worthless animals. After the order was issued (it was about two weeks afterwards) an Indian came in and complained that some Navaho had killed one of his horses. I inquired whether it was a broncho or work horse. He said it was not a work horse. I then asked if the horse was of any use to him. He said, "No." I asked, "Why did the fellow kill your horse?" He said, "To eat." I remarked, "He must have been very hungry," and he said, "Maybe." After explaining to him the great disadvantages and loss of good time in caring for such worthless horses, and the large amount of grass they consumed, and the waste and killing out the grazing which their sheep and goats would otherwise have, and the necessity which forced this Navaho on account of hunger to kill his horse for food, he finally concluded that, probably, no great wrong had been done. From that on there were but very few complaints along that line, and those who did complain were very readily convinced that my plan was for the best interest of the entire tribe. They are very philanthropic when it comes to a matter of hunger. No one has so little food but that he will divide with his hungry fellow-men. Their custom while partaking of a meal is that no matter which of their tribe should come in he helps himself without any formal invitation or ceremony. Such hospitality does not stop with their own people. If a white person called at their hogan and made them understand that he was hungry, in case they had nothing to eat they would soon slaughter a sheep or goat and broil a piece for the hungry caller.

IMPROVEMENTS.

During the past year we have improved the water system at the agency and school by putting down a 4-inch, spiral, riveted pipe from the spring to the plant, a distance of about 1¼ miles, and connecting the same with the different school buildings. For this we were allowed $3,100 for labor, and the work was mostly done by Indians.

We have also constructed a fine stone laundry, 30 by 60 feet. This labor was also performed by Indians under supervision of one white man as foreman.

There has also, under contract, been installed at the school a fine steam engine for pumping purposes, a large cistern built near the laundry to receive the water from the main line, which, by the aid of the engine, is pumped into a large tank, built under the same contract on the side of the mountain at an elevation of 84 feet above the base of the school buildings. This tank is inclosed in a good, substantial house, well painted. This makes our water system quite complete and affords good pressure

from the tank, which is only intended for fire protection, the gravity system from the spring being sufficient for ordinary purposes.

For the overflow from the cistern we have a 4-inch pipe laid underground to the school garden, thus furnishing a good supply for irrigating the school garden.

IMPROVEMENTS AT LITTLE WATER SCHOOL.

At this school we have put down a new well, 37 feet deep, walled with stone, being 10 feet in diameter in the clear. Over this we have erected a good substantial pump house and installed a 4-horsepower Fairbanks, Morse & Co., gasoline engine for pumping the water into a tank some 300 feet distant and located near the school buildings.

We also have in course of erection a new school building which will give us a schoolroom with capacity for 30 pupils, dining room and kitchen with capacity for 140 pupils, sewing room, recreation room, and two large rooms for employees' quarters, with a basement under part of the building sufficient to store all the vegetables needed for the school and employees. This building will have a belt measurement of about 350 feet. We will also make two additions to the girls' dormitory for sick room and mess kitchen for employees. This building will cost about $6,000, complete.

During the year we have made considerable new road, improved some of the old, built three new bridges, and kept all others in good repair.

WORK IN THE SAN JUAN RIVER COUNTRY.

The Government has built one irrigation ditch under the supervision of S. E. Shoemaker, supervisor of constructed ditches, who is located opposite the little town of Fruitland, N. Mex., on the south side of the river near the north line of this reservation. The ditch built is some 35 miles down the river on the south side thereof. This ditch is about 4½ miles in length and is susceptible of irrigating about 600 acres of land.

Mr. Shoemaker is now at work on another ditch some distance below this, which will be about 4 miles in length when completed and will irrigate about 500 acres. This work is being done largely by Indian labor. There are other locations farther down the river which should have ditches and no doubt they will be made if the Department authorizes them and allows money for their construction. Mr. Shoemaker, supervisor of constructed ditches, is a practical man and no better man could be found for such work.

NEED OF EDUCATIONAL WORK.

There should be a school building erected near the San Juan River about 8 miles below Farmington, which would be near the proposed irrigation ditch. This should be a strictly agricultural school as when the proposed ditch is built there will be at least 3,500 acres under this ditch.

At Little Water School there should be a good, substantial warehouse; a laundry; a new and strongly built tower and steel tank with a capacity of 12,000 gallons; a new pipe line constructed from the pump, also from the tank to each building; there should also be a barn built of sufficient capacity for four horses with storage room for forage; the sewerage system should be extended to the building in course of erection.

At the Navaho Boarding School there should be a new barn unless the agency be segregated from the school, which I earnestly recommend should be done. The agency proper should be located some 30 miles north of the school in Cottonwood Pass, where there is an abundance of water and timber. The sawmill should be moved to this point also in order to supply lumber for the Indians and the Government buildings on the north and along the San Juan River where they have never had an opportunity of getting any lumber, the mill having been located where it now stands for the last twenty years. It would seem that the Indians in the southern part of the reservation have been quite well served while those over the mountain and along the river could not on account of bad roads and distance possibly receive the benefits those living near the mill and agency have had. There should be an addition to the school dining room, a commodious assembly hall with four large school rooms under the same roof. The bathroom in the girls' building should be enlarged and a full set of new fittings placed therein.

We have been favored with official calls from Colonels Nesler and Tinker, inspectors; Supervisor of Construction Charles, and Supervisor of Agriculture Chubbuck.

The agency employees, with one exception, have been good and faithful, loyal and true to their duties. The agency carpenter and wheelwright and financial clerk have been exceptionally faithful and industrious.

The school employees who have been here long enough for me to become acquainted

with their work have all, without an exception, been excellent employees, have worked hard and have done their full duty, and the children under their charge have made as much progress as was possible for them.

Mrs. Eldridge, field matron, located on the San Juan River, has done much good work among the Indians. Mrs. Cole, field matron, located in the Chin Lee Valley, near the mouth of Canyon de Chilley, some 50 miles from the agency, is doing much good for the tribe in that part of the country. These two ladies have their whole heart and soul in the work for the betterment of the Indians, and too much can not be said in commendation.

I herewith submit the report of the superintendents of the Navaho and Little Water schools, also report of the Catholic Mission School, and the report of Mr. Frijling, the local missionary here. From the report of the latter it would be inferred that he has made but little progress. He does not seem to have the tact to interest the children and get them to take in the idea of his subjects. It requires a very broad mind, one that is practical, to make the best impression on these people. There is also a missionary of the same denomination as Mr. Frijling at the Little Water School.

There is a missionary established at Two Gray Hills, some 60 miles north of the agency, conducted by Reverend Wright under the auspices of the Baptist Church.

The Presbyterians have a missionary established at Ganado, 35 miles west of the agency, under charge of Rev. Mr. Bierkemper, who is doing excellent work among the Indians, caring for the sick and assisting them in building roads, developing water, etc. He is very broad in his views and has an excellent idea as to their many needs. Mrs. Bierkemper has a small class as a day school.

THE PUEBLO INDIAN DAY SCHOOLS.

By Miss M. E. DISSETTE, *supervising teacher.*

These schools number 18, 10 of which are in the district of Santa Fe and 8 in the district of Albuquerque. With one exception they were in session for ten months—from September 1, 1902, to July 1, 1903. The exception was at Cochiti, where the school was opened October 1.

LOCATION.

These schools are located in the following villages: Nambe, about 20 miles northwest of Santa Fe and 20 miles from a railroad station; Santa Clara, 35 miles northwest of Santa Fe and 2 miles from a railroad station; San Ildefonso, 28 miles northwest of Santa Fe and 10 miles from a railroad station; San Juan, 38 miles northwest of Santa Fe and 1 mile from a railroad station; Picuris, 60 miles northwest of Santa Fe and 22 miles from a railroad station; Taos, 80 miles north of Santa Fe and 38 miles from a railroad station; Cochiti, 25 miles west of Santa Fe and 12 miles from a railroad station; San Domingo, 35 miles southwest of Santa Fe and 3 miles from a railroad station; Jemez, 40 miles west of Santa Fe and 30 miles from a railroad station; Zia, 40 miles southwest of Santa Fe and 20 miles from a railroad station; Isleta, 12 miles west of Albuquerque and one-fourth mile from a railroad station; San Felipe, 35 miles southwest of Albuquerque and 8 miles from a railroad station; Laguna, 66 miles west of Albuquerque and very near the railroad station; Pahuate, 66 miles west of Albuquerque and 12 miles from a railroad station; Paraje, 72 miles west of Albuquerque and 6 miles from a railroad station; Acomita, 82 miles west of Albuquerque and 12 miles from a railroad station; Santa Ana, 20 miles north of Albuquerque and 6 miles from a railroad station; Seama, 75 miles west of Albuquerque and 6 miles from a railroad station.

These schools have all been visited by me at least once in each quarter, and a report made upon the condition and needs of each school after each visit. This requires 355 miles of railroad travel and 312 miles by conveyance, each quarter, making a total annually of 1,420 miles by rail and 1,248 by wagon.

DATA.

The following tabulated statistics of the Santa Fe district, gleaned from the reports of the teachers, show the status of the work in 10 of these schools. I regret that I could not obtain the necessary data from the Albuquerque district to present it in the same form. The reports for the year were not completed at the time of my last visit.

In studying these figures the reader is asked to bear in mind the fact that, in villages not more than 10 miles apart, conditions differ so widely that comparisons made without a knowledge of these differences are almost sure to be unfair.

As nearly as I can ascertain the facts, the enrollment in the 8 day schools of the Albuquerque district was about 250, with an average attendance of 206. There were also enrolled in the Government nonreservation and mission board schools about 150, making a total enrollment of 400 Indian children in school from that district, which is about 72 per cent of all the children of school age.

The number of Indians who can read and speak English is much greater in the Albuquerque district, since the four Laguna villages have more "returned students" than all the other villages combined.

Name of village.	Population.	Number of school age.	Enrolled in day school, 1903.	Average attendance.	Enrolled in Government Boarding School.	In other schools.	In all schools.	Amount paid in salaries.	Amount of other expenses.	Approximate cost.	Number of Indians speaking English.
Cochiti	210	65	30	16	18	14	62	$648	$186	$834	109
Jemez	470	98	47	30	23	10	80	1,020	457	1,477	42
Nambe	99	35	23	16	4	5	32	1,020	211	1,231	23
Picuris	102	30	13	9	13	.....	26	720	148	868	16
Santa Clara	245	71	44	34	27	.....	71	990	266	1,256	76
Santo Domingo	840	200	39	15	20	.....	59	1,020	197	1,217	25
San Juan	402	88	28	19	39	13	80	720	161	881	58
San Ildefonso	158	45	22	18	18	3	43	800	209	1,009	38
Taos	427	108	58	41	13	2	73	1,020	431	1,451	32
Tesuque[a]	79	27	4	4	23	18	24	72	2	74	17
Zia	118	31	24	19	7	.....	31	720	207	927	45
Total	3,150	798	332	221	184	65	581	8,750	2,475	11,225	481

[a] Closed October 1, 1902.

NOTE.—A comparison of the third and eighth columns shows that nearly 73 per cent of the Pueblo children are in school.

BUILDINGS.

These are mainly owned by the Indians and are gradually being improved in size, condition, and suitability. Nine villages have been induced to make improvements from the funds received for rent. These improvements range from the putting in of board floors at the San Felipe to an entire new plant at Paraje. When one considers the difference in intelligence of these two villages the board floors mark as long a step forward in the former as the entire new plant does for the latter.

ATTENDANCE.

Each year sees the enrollment and average attendance gradually becoming more nearly equal. The custom of coming to the teacher to be excused when absence is necessary is fast becoming quite general. Our best day schools compare quite favorably with the ordinary district schools of the States where the older pupils are invariably taken out to plant and harvest the crops. The main difference is that conditions of life are harder and methods of work slower in Indian villages, and therefore children are put to work at an earlier age.

In each district one or two conservative villages are responsible for lowering the average of all. In the district of Santa Fe it is Santo Domingo, and in the district of Albuquerque it is Acomita. At the latter place the Indians return to old Acoma in the winter for religious feasts and dances, taking their children with them, so that in December and January the attendance is very small.

EQUIPMENT.

A steady advancement in the nature and amount of the school supplies and in the furnishing of the teachers' quarters is responsible for much of the improvement in the schools. In all schools the heavier articles of furniture are now provided, and the reign of the packing box is nearly over. The introduction of single desks, modern text-books and school aids, portable blackboards and slated cloth, a variety of reading charts, the use of cabinet organs and of industrial material—all these have worked wonderful changes in the quality of the work done and in the pupils doing it.

LINES OF WORK.

There are just two lines of work possible in these day schools: Primary class-room work and simple domestic industries, such as sewing, knitting, cooking, spinning, gardening, poultry raising, and all that pertains to home making and housekeeping.

The nature of the work and the conditions under which it is done make it peculiarly a work for women by women. Wherever a conscientious, intelligent, practical, and refined woman has been sent the results have been most satisfactory.

SIGNS OF PROGRESS.

The most convincing of these is a disposition on the part of most villages to provide better quarters for the school and the teacher. In villages where the school work is wisely and tactfully done, where the teacher shows genuine interest in the lives of the people and affection for their children, the Indians are willing to make some effort to cooperate with the work of the school. With better quarters and furnishings provided it has been easier to retain the best teachers long enough to have their work make some impression.

BETTER METHODS OF TEACHING

have come as a natural sequence, and the Indian parent is beginning to see that these schools exist not for the benefit of the teachers but for the Indian children. The mothers have been won by the emphasis laid upon domestic industries, and the encouragement given to their native arts, and their love for and pride in their children.

RACE PREJUDICE IS BEING BROKEN DOWN.

By contact with intelligent, sympathetic women, associating with them on lines of work common to women the world over, the Indian woman finds that she is not despised, her better nature is constantly appealed to, and doors are opened for the elevation of the home life, through which civilization must enter if it comes at all. The homes are cleaner because the mothers help with the sewing and do the washing for their children. They emulate the example of their teachers in housekeeping and come constantly to them for help and advice. Our best teachers realize that the day school exists, most of all, for the Pueblo girls, in whose hands lie the molding of all the character of the next generation of children, and that their training in home making is the most important work the teacher has. To meet this need our most intelligent and energetic teachers are introducing sewing, knitting, bead work, and basketry with good results. These industries are being taught, not for what they will bring to that village or that individual in money, but for what they will develop in application, perseverance, manual skill, love of the beautiful, self-respect, and all the far-reaching results which a possession of these qualities insures. Other teachers are taking up gardening and poultry raising, with the result that land and water, once withheld, is now freely offered, and requests for seeds, trees, and plants are coming in constantly. This has brought about a rapid growth in the use of English. The language learned from books is vitalized and made an actual advantage instead of remaining a dead letter, and the mysterious processes and uninteresting routine of the schoolroom is rapidly giving way to methods of rational employment and mental enjoyment. Automatic recitations and book-bound schools will, we hope, soon exist in memory only. In every school are now found some pupils who can interpret everything that is said.

LITERARY ADVANCEMENT.

On account of the barrier of language, the tender age of the pupils, and the peculiar domestic arrangements in the homes, which sometimes conflict with school hours, the literary test is the severest that can be applied to these schools; neither is it a practical test of the school's usefulness and right to exist. But these schools can stand that test also. Four years ago there were only two schools which had any pupils advanced to the second reader, and in only one was there a third reader used. To-day all schools have a class advanced to the second reader, and some are ready for third-grade work.

CONDITIONS AND CUSTOMS.

The emphasis laid upon industrial work and the improvement of the immediate surroundings of the pupils have given teachers a better understanding of the customs of the people. Finding that they are the outgrowth of the conditions and needs of a hard-working, self-sustaining people there is less of friction and more of sympathy between parents and teachers. Both make concessions with mutual benefit. Teachers are prevented from growing autocratic and arbitrary, and Indian mothers get the benefit of higher intelligence in the management of household affairs; therefore the small villages, where the teacher's influence prevails, show the greatest advancement.

In intelligence, thrift, cleanliness, health, material prosperity, and in morality, the four villages of Laguna are in advance of all others. Years of patient toil on the part

of obscure and unappreciated female teachers, with the influence of the much discussed, and often maligned, "returned student," have been the most potent factors in their development. In all of these villages any woman with dignity, common sense, and refinement is just as safe, and safer, than in most white communities.

HEALTH.

With the exception of an epidemic of diphtheria at Santa Clara, in which 10 or 12 children died last winter, the villages have had no epidemics of any kind. The self-sacrifice of the teacher, Miss Clara True, who with her mother stayed in the village and did much to preserve the health of her pupils, is of the genuine stamp. Her prompt action in buying up and burning infected bedding, etc., probably saved the lives of many. This expense and that of food and necessaries for the sick and poor she bore personally. The influence of such women for good in these villages can hardly be overestimated.

SCHOOL EXHIBITS.

A very successful institute was held in April in the Albuquerque boarding school, under Supervisor A. O. Wright. It was attended by the teachers of both day and boarding schools, and the topics discussed embraced both industrial and class-room work. The specimens of work from the day schools and the papers presented by the teachers showed them to be practical, up-to-date workers, of more than average intelligence and ability. In June, 16 large sheets of cardboard, covered with specimens of the pupils' work, both literary and manual, were sent to Boston. This work compared very favorably with that of any other children who have the barrier of language to contend with.

If these schools are left to the care of capable women, as all primary schools are among Americans, there is no reason why, with the very liberal support given them by the United States Government, they should not become very powerful influences in removing, from some dark corners of this fair Territory, the stigma of illiteracy now resting upon it.

UNITED STATES INDIAN INDUSTRIAL SCHOOL AT SANTA FE.

CLINTON J. CRANDALL, *Superintendent.*

I have the honor to report that the session of this school which closed June 30, 1903, was a very successful one.

The total enrollment of pupils during the year amounted to 398, and the average attendance to 330. Of those enrolled about 250 are from New Mexico, 224 being from the various pueblos.

The health of the pupils has been remarkably good, there not being a single death at the school nor a case of any contagious disease.

During the past year there has been no increase in the capacity of the school, and no effort has been made to increase the enrollment over that of preceding years. The work has been along the same practical lines which have given good results with these Indian children. Each pupil is in the schoolroom but half of each day; the other half of the day is devoted to industrial training, either in the shops or in carrying on the necessary work of the school. The work in the schoolroom does not go beyond the eighth grade, simply what may be called the common school branches. Especial effort is made to impart a knowledge of the English language, and the use of any other at the school is prohibited.

The work in the shops is considered of equal importance with that of the schoolroom, and that it is of a practical kind is shown by the fact that most of the clothing worn by the boys is made in the tailor shop at the school; it is the same with the shoes; the girls also make all of their dresses. The necessary repairs and the work required to keep the plant in good condition afford to the carpentering and blacksmithing details plenty of opportunities for practical work. As much attention is devoted to agriculture and gardening as the limited water supply will allow.

The fact that out of a total of 35 employees but 7 are class-room teachers will show the importance attached to industrial teaching.

The cost of conducting the school during the past year was about $57,000. Of this amount, about $20,000 was for salaries of employees and $37,000 for supplies and maintenance and repairs of the school. About $28,000 of this was disbursed from this office. In addition, $18,000 was disbursed for the support of the day schools maintained in 10 Indian pueblos. Nearly all of this $46,000 was distributed among residents of the Territory.

The general condition of the Indians living in the pueblos is the same as last year. Their crops have been fair, though the grasshoppers were very destructive at Taos and Picuris, and the Indians at Sia suffered for lack of water.

During the past winter the Government has aided the Indians of the Cochiti pueblo by constructing for them a new irrigation ditch at a cost of about $9,000. This will assure these Indians an abundant water supply in the future. No other improvements are under way.

United States Indian school at Albuquerque and southern Pueblo day schools.

Name and location.	Number of schools.	Number of teachers.	Enrollment.	Number of months taught.	Salary paid teachers.	Total receipts.	Total expenditures.	Total value of property.
Albuquerque, N. Mex.	1	30	377	12	$19,270.00	$55,600.00	$52,384.00	$95,000.00
Southern pueblos:								
San Felipe	1	3	35	10	1,740.00	1,527.00	1,527.00	450.00
Santa Ana	1	1	15	10	720.00	560.50	560.50	320.00
Isleta	1	1	30	10	720.00	1,075.46	1,075.46	500.00
Laguna	1	5	35	10	3,000.00	1,165.00	1,165.00	475.00
Pajuate	1	1	25	10	720.00	965.00	965.00	375.00
Paraje	1	1	15	10	720.00	915.00	915.00	400.00
Seama	1	1	23	10	720.00	564.00	564.00	425.00
Acoma	1	2	17	10	720.00	976.00	976.00	450.00

A number of improvements have been made during the past year. Frame buildings have been moved to better locations and painted and repaired, and several hundred feet of new sidewalks are now being laid. Further improvements recommended for the coming year are:

The building of a new mess kitchen and dining room, with all modern cooking appliances; a steam-heating plant; a new laundry, with appliances, and a new manual training building and equipment.

In addition to the above, I have requested $5,500 to be expended in making general repairs and improvements.

THE SAN ILDEFONSO CANAL, BUILT FOR THE PUEBLO INDIANS BY THE GOVERNMENT.

EDDY COUNTY IRRIGATION CANAL.

REPORT OF SUPERINTENDENT OF IRRIGATION ON THE PUEBLO AND JICARILLA INDIAN RESERVATIONS.

J. B. HARPER, *Superintendent.*

The work in irrigation for the Pueblo Indians for the past year was confined to the pueblo of Cochiti, where $8,400 were expended.

At this point the trouble had been to get water into their ditch after the flood period had passed.

To build on a lower level would throw out of cultivation most of their best land, and to extend the ditch up the stream to such a point as would enable water to be drawn from it readily at all seasons would require the ditch to be built across the face of a precipitous rock bluff and at such a height as to be exposed to every flood that came down the Rio Grande. The Indians for centuries have been attempting to meet the situation by building a dam in the stream when the water fell to raise it to sufficient height to enter the ditch, but their work was never more than a partial success and often a failure, because the river bed is shifting sand and the work of the previous year was always swept away by the spring freshets. And frequently in the summer, when their dam was built after weeks of work, a slight raise in the stream would take it out and their crops would burn up before another could be constructed.

To avoid this obstruction it was decided to drive a tunnel through the rock about 100 feet back from the face and continue the ditch upstream three-fourths of a mile, on comparatively easy line to build, to a safe location for the headgate.

The tunnel, 715 feet long, and heavy work below it, is all finished and the Indians are using it this season.

The plans for a large reservoir dam at Zuni have been approved and construction authorized. Work will be commenced as soon as the plant can be assembled.

PART IV.

This part covers the reports of the Territorial officers, boards, and commissions. Owing to the fact that the last legislative assembly only a few months ago established an orphans' home at Belen, an institute for the blind at Alamogordo, a miners' hospital at Raton, a reform school at El Rito, an armory at Las Vegas and at Albuquerque, no reports of the governing boards of these institutions are included in this report, although the boards have been organized and the sites for the new institutions have been selected.

The Territory owns the following public buildings:

	Value.
Capitol	$400,000
Penitentiary	500,000
College of Agriculture and Mechanic Arts	100,000
Asylum for the Insane	80,000
School of Mines	70,000
University of New Mexico	65,000
Normal University	65,000
New Mexico Military Institute	62,000
Old Palace	30,000
Normal Training School	38,000
Asylum for Deaf and Dumb	20,000

To this total will be added very soon new buildings at different institutions, improvements at the present buildings, and buildings for the new institutions created by the last legislative assembly, so that the value of the public property owned by the Territory outside of the grants of land to the various institutions and to the public schools will be fully $2,000,000 before the next annual report will be made.

In this part are included the reports of—

The secretary of the Territory.
The treasurer of the Territory.
The auditor of the Territory.
The traveling auditor of the Territory.
The superintendent of public instruction.
The solicitor-general.
The commissioner of public lands.
The Territorial librarian.
The game and fish warden.
The adjutant-general.
The clerk of the supreme court.
The clerk of the first judicial district.
The clerk of the second judicial district.
The clerk of the third judicial district.
The clerk of the fourth judicial district.
The clerk of the fifth judicial district.
The district attorney for Santa Fe, Rio Arriba, Taos, and San Juan counties.
The district attorney for Bernalillo, Sandoval, McKinley, and Valencia counties.
The district attorney for San Miguel, Leonard Wood, Mora, and Quay counties.
The district attorney for Colfax and Union counties.
The district attorney for the county of Socorro.
The district attorney for Doña Ana, Luna, Otero, and Lincoln counties.
The district attorney for Grant and Sierra counties.
The district attorney for Chaves, Eddy, and Roosevelt counties.
The Univerity of New Mexico.
The New Mexico College of Agriculture and Mechanic Arts.
The School of Mines.
The New Mexico Normal University.
The New Mexico Normal School.
The New Mexico Military Institute.

The New Mexico Asylum for the Deaf and Dumb.
The New Mexico Insane Asylum.
The New Mexico Penitentiary.
The board of equalization.
The commission of irrigation.
The cattle sanitary board.
The sheep sanitary board.
The board of Louisiana Purchase Exposition managers.
The bureau of immigration.
The Territorial board of health.
The board of dental examiners.
The New Mexico Board of Pharmacy.
St. Vincent's Hospital and Orphanage, at Santa Fe.
St. Joseph's Sanitarium, at Albuquerque.
St. Joseph's Hospital, at Silver City.
Grant County Charity Hospital, at Silver City.
Ladies' Hospital, at Deming.
Eddy County Hospital.

A statistical synopsis of this report.

REPORT OF THE SECRETARY OF THE TERRITORY.

By J. W. RAYNOLDS.

GENERAL ELECTION, 1902.

On November 4, 1902, there was held our biennial election for the selection of a Delegate to the Fifty-eighth Congress, members of the thirty-fifth legislative assembly, and all county officers. For the first time, so far as known, the results of this election for each official were accurately tabulated by precincts and counties, and these statistics are readily available for consultation and comparison. The complete tabulation is somewhat too extensive to warrant reproduction here, but an abstract of the vote for Delegate by counties is given in Table II.

OFFICIAL REGISTER.

In connection with the tabulation of election returns there was prepared a register of all the officials elected, and this, subjoined to the roster of Territorial and Federal officers, gives for the first time a complete official register, which will be found appended.

THIRTY-FIFTH LEGISLATIVE ASSEMBLY.

This assembly convened on the 19th day of January, 1903, for the usual session of sixty days. Work was prosecuted vigorously throughout the entire session, and the laws enacted exceeded in number those of any session since 1890. Many of the acts passed will be far-reaching in importance and productive of great good in the future.

The funds for our legislative assembly are appropriated by Congress upon an estimate prepared in this office and submitted through the honorable Secretary of the Treasury. A comparative statement of the expenditures in 1901 and 1903 is given herewith, from which it will be noted that the expenses are increasing with each session and have reached practically the limit of the appropriation. It has been necessary to ask for an increase for 1905, the estimate amounting to $26,000, and any steps that may be taken to assist in securing this appropriation will be a help in expediting the public business.

TABLE I.—*Summary of legislative expenses fiscal years 1901 and 1903.*

	1901.	1903.
Appropriation	$24,250.00	$24,250.00
Salaries, officers of legislature	3,060.00	3,060.00
Salaries, members of legislature	8,880.00	8,880.00
Mileage, members of legislature	2,085.00	2,046.30
Stationery, rent, light, and miscellaneous	2,116.78	2,380.05
Printing laws, journals, and bills	2,511.47	3,748.10
Total legislative	18,653.25	20,114.45
Salaries and expenses, secretary's office	2,654.57	3,510.48
Expended	21,307.82	23,624.93
Balance refunded	2,942.18	625.07
To balance	24,250.00	24,250.00

TERRITORIAL BANKS.

The act of 1903, creating the office of traveling auditor and bank examiner, very wisely transferred the duty of examining banks and the custody of statements and reports from this department to that of the new official. In compliance with the act in question all reports, statements, and similar documents relating to Territorial banks heretofore in the custody of the secretary have been transferred to the bank examiner.

COMMISSIONS.

In 1903 commissions were issued to 5 commissioners of deeds for New Mexico in other States, to 288 notaries public in the several counties, and to 325 Territorial officials, members of boards and committees, a total of 618, as compared with 345 during the previous year.

Commissioners for New Mexico in other States and countries.

Name.	Post-office.	Term expires.
Abraham H. Fisher	Baltimore, Md	Aug. 16, 1908
Simeon W. King	Chicago, Ill	Aug. 15, 1908
James L. King	San Francisco, Cal	Sept. 18, 1903
Alfred Mackay	New York, N. Y	Oct. 21, 1903
Chas. S. Bundy	Washington, D. C	Nov. 4, 1908
Edwin F. Corey	New York, N. Y	Nov. 20, 1908
Isador J. Pocher	....do	Dec. 11, 1908
Livingston W. Cleveland	New Haven, Conn	Mar. 31, 1904
Thos. J. Hunt	Philadelphia, Pa	Mar. 7, 1904
John S. Wurts	....do	May 24, 1904
Chas. Edgar Mills	New York, N. Y	Jan. 14, 1905
Chas. Hall Adams	Boston, Mass	Feb. 23, 1907
J. Burke Hendry	London, England	May 8, 1907
Joseph B. Braman	New York, N. Y	Aug. 1, 1907

CORPORATIONS.

The healthy condition of the department in matters relating to business corporations continues unabated, and comparative statistics covering the years 1902 and 1903 will be found in Tables III, IV, and V.

A slight decrease is noticeable in the number of companies formed for mining purposes, but, on the other hand, there was an increase of 70 per cent in the number of manufacturing and industrial corporations, and an increase of 40 per cent in proposed railway mileage. As our greatest present needs are found in these two fields, there is every reason to be gratified at this showing. An increase of 30 per cent in the amount collected for the Territorial treasury is likewise a subject for congratulation.

Fortunately for our future prospects, the last legislature took a long step toward putting us on an equal footing with other Commonwealths by the enactment of a business-like law governing the fees for filing corporation papers, thus displacing the previous law, which was antiquated and difficult of comprehension.

In addition to the many local requests for information upon the laws governing the formation of corporations, this office is called upon each day to answer several similar letters from all parts of the United States. This being a matter which is of great interest to the prospective investor, and many important changes having been made by the last legislature, a copy of the requirements, as amended, will be given below.

All corporations organized or consolidated under the laws of New Mexico, or under the laws of any other Territory, State, or country, shall, before doing business in this Territory, file in the office of the secretary of New Mexico articles of incorporation in writing, according to law in such case provided; and at the time of such filing the secretary shall collect the following fees:

For railroad or other corporations formed for pecuniary profit, 10 cents for each and every thousand dollars of capitalization, and a like fee upon each subsequent increase of capital, but in no case less than $25.

For filing any certificate of amendment to articles of incorporation other than one increasing capital stock, or any translated copy of articles or amendments, $10.

For filing any certificate of business and agent, when required by law, $5.

For corporations organized for benevolent, charitable, educational, religious, and scientific purposes, having no capital stock, $1.

For filing any certificate of amendment to such articles of incorporation, $1.

For filing any certificate, instrument, or document other than those specified above, $1.

For certified copies, 10 cents per folio of 100 words, plus $1 for the certificate.

Every corporation, domestic or foreign, shall file with the recorder of deeds of the county in which its principal place of business in this Territory is located, a copy of its articles of incorporation, of every amendment thereto, and likewise any certificate designating agent and place of business in this Territory, certified from the office of the secretary of the Territory; and it shall be a misdemeanor for any recorder to file or record in his office any incorporation papers or copies thereof not previously certified by the secretary of the Territory. (Ch. 114, L. 1901.)

PUBLICATION OF ARTICLES.

Every corporation desiring to organize under the laws of this Territory, and every foreign corporation, in addition to other requirements now provided by law, desiring to do business under the laws of this Territory, shall, within thirty days from the date of the filing of its articles of incorporation with the secretary of the Territory, cause to be published a certified copy of its articles of incorporation in some newspaper of general circulation in the county where its principal place of business is designated, and, in the case of foreign corporations, in the county wherein resides the agent of said corporation upon whom process may be served.

A certificate of such publication, properly sworn to by the publisher, shall be filed with the secretary of the Territory within twenty days after the date of the last publication.

Any corporation, domestic or foreign, neglecting or refusing to comply with the provisions of this act, shall be fined in a sum not less than $100 for each and every day it shall so refuse and neglect to comply with the provisions of this act; and upon complaint properly lodged with the solicitor-general of this Territory, in a proceeding to be brought by him, the articles of incorporation and charter of the corporation so violating the provisions hereof shall be vacated, and thereafter shall not be permitted to conduct or operate any business in this Territory. (Ch. 77., L. 1901.)

ABSTRACT OF LAWS GOVERNING THE FORMATION OF COMPANIES IN NEW MEXICO.

Careful compliance with these provisions will obviate delays incident to returning copies for correction.

(1) Corporations may be formed for benevolent, charitable, educational, and scientific purposes, and for any legitimate business enterprise. (Special provisions for railroads, irrigation companies, banking, insurance, and building and loan associations.)

(2) Any three or more persons who desire to form a company for one or more of the above purposes shall make, sign, acknowledge before some official competent to take the acknowledgment of deeds, and file in the office of the secretary of the Territory their articles in writing, setting forth—

I. The full names of such persons.

II. The corporate name of the company.

III. The objects for which the company shall be formed.

IV. The amount of capital stock and number of shares into which divided.

V. The term of existence, not to exceed fifty years.

VI. The number of directors, and their names, who shall manage the concerns of the company for the first three months.

(The board of directors must consist of at least three members who are stockholders, a majority citizens of the United States and one-third residents of New Mexico.)

VII. The name of the city or town and county where the principal place of business is to be located.

(Whenever a majority of the stock is owned in another State or Territory, the principal office of such company may be located in such State or Territory and meetings of the stockholders and directors may be held there: *Provided*, That such company shall file with the secretary of New Mexico a certificate designating a principal place of business in this Territory and agent residing thereat, upon whom process may be served, in the same manner as is required by foreign corporations.)

VIII. Date, signatures, and acknowledgment in same manner as deeds are required to be acknowledged.

(3) If any corporation fail to organize and commence the transaction of business within two years from the date of filing articles its corporate powers shall cease.

LAWS RELATIVE TO FOREIGN CORPORATIONS DOING BUSINESS IN NEW MEXICO AS AMENDED IN 1903.

How admitted.—SECTION 445. Every company or corporation incorporated under the laws of any foreign State or Kingdom, or of any State or Territory of the United States, beyond the limits of this Territory, shall file in the office of the secretary of

the Territory, a copy of its charter of incorporation, or of its articles of incorporation, together with the law or laws under which it is incorporated, each duly certified and authenticated by the proper authority of such foreign State, Kingdom, or Territory.

Such company shall also, before it is authorized or permitted to do business in this Territory, make and file with the secretary of the Territory a certificate signed by the president and secretary of such company, duly acknowledged, designating the principal place where the business of such company shall be carried on in this Territory, and an authorized agent or agents residing at such principal place of business upon whom process may be served.

A copy of such charter or articles of incorporation and certificate of place of business and agent, duly certified by the secretary of this Territory, shall be filed in the office of the recorder of deeds in the county in which the principal place of business of such corporation shall be.

Such corporation shall have the same powers and shall be subject to all the liabilities and duties as corporations of a like character organized under the general laws of this Territory. But they shall have no other or greater powers, and no foreign or domestic corporation established or maintained in any way for pecuniary profit of its stockholders or members shall purchase or hold real estate in this Territory, except as provided for in this act and the laws of the Territory now existing, and no corporation doing business in this Territory, incorporated under the laws of any other State, shall be permitted to mortgage, pledge, or otherwise incumber its real or personal property, situated in this Territory to the injury or exclusion of any citizen, citizens, or corporations of this Territory who are creditors of such foreign coporation, and no mortgage by any foreign corporation except railroad and telegraph companies, given to secure any debt created in any other State, shall take effect as against any citizen or corporation of this Territory until all its liabilities due to any person or corporation in this Territory at the time of recording such mortgage have been paid and extinguished.

Penalty.—SEC. 446. A failure to comply with the provisions of the foregoing section shall render each and every officer, agent, and stockholder of any such corporation so failing, jointly, severally, and personally, liable on any and all contracts of such company made within this Territory during the time that such company is so in default. And in addition such company or corporation shall be liable to forfeit and pay to the Territory of New Mexico the sum of $50 per day for each and every day in which it may carry on business or assume and hold itself out to carry on business in such Territory without fully complying with all the provisions hereinbefore provided, such sum to be collected by the solicitor-general; and until payment is made such company shall not be allowed to carry on business. Such money, when collected, shall be turned over to the treasurer of the Territory, for the benefit of the general school fund.

Grounds of attachment.—SEC. 2686.

* * * * * * *

First. When the debtor is not a resident of, nor resides in this Territory.

* * * * * * *

Sixth. Where the defendant is a corporation whose principal office or place of business is out of this Territory, unless such corporation shall have a designated agent in the Territory upon whom service of process may be made in suits against the corporation.

* * * * * * *

Official register.

[Corrected to June 30, 1903.]

TERRITORIAL OFFICERS.

Office.	Name.	Address.	Term expires.
Governor	Miguel A. Otero	Santa Fe	Jan. 22, 1906
Secretary	J. W. Raynolds	do	Jan. 18, 1906
Solicitor-general	E. L. Bartlett	do	Mar. 17, 1905
Auditor	W. G. Sargent	do	Do.
Treasurer	J. H. Vaughn	do	Do.
Superintendent of penitentiary	H. O. Bursum	do	Do.
Superintendent public instruction	J. Francisco Chaves	do	Do.
Librarian	Lafayette Emmett	do	Do.
Commissioner of public lands	A. A. Keen	do	Do.
Adjutant-general	W. H. Whiteman	do	Do.

Official register—Continued.

TERRITORIAL OFFICERS—Continued.

Office.	Name.	Address.	Term expires.
Traveling auditor and bank examiner.	C. V. Safford	Santa Fe	Mar. 17, 1905
Game and fish warden	P. B. Otero	do	Do.
Public printer	J. S. Duncan	Las Vegas	Do.
JUDICIARY.			
Supreme court:			
Chief justice	W. J. Mills	Las Vegas	Feb. 10, 1906
Associate justice	John R. McFie	Santa Fe	Do.
Do	B. S. Baker	Albuquerque	Jan. 18, 1906
Do	F. W. Parker	Las Cruces	Jan. 10, 1906
Do	W. H. Pope		
Clerk	Jose D. Sena	Santa Fe	
District court:			
First district (counties of Santa Fe, Rio Arriba, Taos, and San Juan)—			
Judge	John R. McFie	do	
Clerk	A. M Bergere	do	
District attorney	E. C. Abbott	do	Mar. 17, 1905
Second district (counties of Bernalillo, McKinley, Valencia, and Sandoval)—			
Judge	B. S. Baker	Albuquerque	
Clerk	W. E. Dame	do	
District attorney	F. W. Clancy	do	
Third district (counties of Doña Ana, Sierra, Grant, Otero, and Luna)—			
Judge	F. W. Parker	Las Cruces	
Clerk	J. P. Mitchell	do	
District attorney	W. H. Llewellyn, counties of Doña Ana, Luna, and Otero.	do	Do.
Do	R. M. Turner, counties of Grant and Sierra.	Silver City	Do.
Fourth district (counties of San Miguel, Leonard Wood, Quay, Mora, Colfax, and Union)—			
Judge	W. J. Mills	Las Vegas	
Clerk	Secundino Romero	do	
District attorney	S. B. Davis, jr., counties of San Miguel, Mora, Leonard Wood, and Quay.	do	
Do	J. Leahy, counties of Colfax and Union.	Raton	Do.
Fifth district (counties of Socorro, Lincoln, Chaves, Eddy, and Roosevelt):			
Judge	W. H. Pope	Socorro	
Clerk	J. E. Griffith	do	
District attorney	A. A. Sedillo, county of Socorro.	do	Do.
Do	W. H. H. Llewellyn, county of Lincoln.	Las Cruces	Do.
Do	J. M. Hervey, counties of Eddy, Chaves, and Roosevelt.	Roswell	Do

FEDERAL OFFICERS.

Delegate in Congress	B. S. Rodey	Albuquerque	Mar. 4, 1905
Surveyor-general	M. O. Llewellyn	Santa Fe	Jan. 29, 1906
Collector internal revenue	A. L. Morrison	do	(a)
United States attorney	W. B. Childers	Albuquerque	Feb. 13, 1905
Assistant United States attorney	W. C. Reid	Roswell	Mar. 13, 1905
Do	E. L. Medler	Albuquerque	July 18, 1906
United States marshal	C. M. Foraker	do	June 1, 1906
Chief deputy marshal	G. A. Kaseman	do	Do.
Register land office	M. R. Otero	Santa Fe	Jan. 29, 1906
Receiver land office	Fred. Muller	do	Dec. 12, 1905
Register land office	N. Galles	Las Cruces	Jan. 29, 1906
Receiver land office	H. D. Bowman	do	Do.
Register land office	Howard Leland	Roswell	Do.
Receiver land office	D. L. Guyer	do	Feb. 23, 1907
Register land office	E. W. Fox	Clayton	Jan. 12, 1906
Receiver land office	A. W. Thompson	do	Do.
Jicarilla Indian agent	H. H. Johnson	Dulce	(b)

a Not specified. b Civil service.

Official register—Continued.

FEDERAL OFFICERS—Continued.

Office.	Name.	Address.	Term expires.
Navaho Indian agent	G. W. Hayzlett	Gallup	(a)
Mescalero Indian agent	J. S. Carroll	Mescalero	(a)
Superintendent Government Indian school.	C. J. Crandall	Santa Fe	(a)
Do	James K. Allen	Albuquerque	(a)
Superintending teacher Pueblo day schools.	Miss M. E. Dissette	Santa Fe	(a)
Attorney for Pueblo Indians	A. J. Abbott	do	(b)
United States mine inspector	Jo. E. Sheridan	Silver City	(b)
Court of Private Land Claims:			
Chief justice	J. R. Reed, of Iowa		June 30, 1904
Associate justice	W. W. Murray, of Tennessee		Do.
Do	H. C. Sluss, of Kansas		Do.
Do	F. I. Osborne, of North Carolina.		Do.
Do	W. F. Stone, of Colorado		Do.
Attorney	M. G. Reynolds, of Missouri		Do.
Clerk	Ireneo Chaves, of New Mexico.		Do.

TERRITORIAL BOARDS AND INSTITUTIONS.

Name, etc.	Address.	Term expires.
Capitol custodian committee:		
N. B. Laughlin, president	Santa Fe	Mar. 17, 1905
Commissioner of public lands, ex officio secretary	do	Do.
E. L. Bartlett	do	Do.
Territorial board of equalization:		
J. S. Duncan, president	Las Vegas	Do.
Vencealao Jaramillo, secretary	El Rito	Do.
Alejandro Sandoval	Albuquerque	Do.
J. A. Mahoney	Deming	Do.
J. F. Hinkle	Lower Peñasco	Do.
Martin Lohman	Las Cruces	Do.
Robt. P. Ervien	Clayton	
Cattle sanitary board:		
E. G. Austen, president	Las Vegas	Do.
M. N. Chaffin	do	Do.
W. H. Greer	Deming	Do.
C. L. Ballard	Roswell	Do.
W. C. Barnes	Dorsey	Do.
J. A. LaRue, secretary	Las Vegas	
Sheep sanitary board:		
Solomon Luna, president	Los Lunas	Do.
W. S. Prager, vice-president	Roswell	Do.
Harry W. Kelly	Las Vegas	Do.
Thos. D. Burns, jr	Tierra Amarilla	Do.
Chas. Schleter	Clayton	Do.
H. F. Lee, secretary	Albuquerque	
Bureau of immigration:		
W. B. Bunker, president	Las Vegas	Do.
G. Pendleton, vice-president	Aztec	Do.
A. Grunsfeld	Albuquerque	Do.
J. W. Bible, treasurer	Hanover	Do.
J. E. Torres	Socorro	Do.
Max Frost, secretary	Santa Fe	
Land commission, ex officio:		
Governor	do	
Solicitor-general	do	
Commissioner of public lands	do	
Commission of irrigation:		
G. A. Richardson, president	Roswell	Do.
F. Springer	Las Vegas	Do.
G. W. Knaebel, secretary	Santa Fe	Do.
Chas. E. Miller	Anthony	Do.
Carl A. Dalles	Belen	Do.
New Mexico board of health:		
G. W. Harrison, M. D., president	Albuquerque	Do.
M. F. Desmarais, M. D., vice-president	Santa Rosa	Do.
B. D. Black, M. D., secretary	Las Vegas	Do.
W. D. Radcliffe, M. D., treasurer	Belen	Do.
J. H. Sloan, M. D	Santa Fe	Do.
G. C. Bryan, M. D	Alamogordo	Do.
J. J. Shuler, M. D	Raton	Do.

a Civil service. b Not specified.

Official register—Continued.

TERRITORIAL BOARDS AND INSTITUTIONS—Continued.

Name, etc.	Address.	Term expires.
Board of dental examiners:		
L. H. Chamberlin, president	Albuquerque	Mar. 17, 1905
C. N. Lord, secretary and treasurer	Santa Fe	Do.
F. E. Olney	Las Vegas	Do.
A. A. Bearup	Carlsbad	Do.
E. L. Hammond	Las Vegas	Do.
Board of pharmacy:		
A. J. Fischer, secretary	Santa Fe	Mar. 19, 1904
P. Moreno	Las Cruces	Mar. 19, 1905
W. C. Porterfield	Silver City	Mar. 19, 1906
E. G. Murphy	Las Vegas	Mar. 19, 1907
B. Ruppe, president	Albuquerque	Mar. 19, 1908
Board of Louisiana Purchase Exposition managers:		
Chas. A. Spiess, president	Las Vegas	Mar. 1, 1905
Carl A. Dalies, vice-president	Belen	Do.
W. B. Walton, secretary	Silver City	Do.
Arthur Seligman, treasurer	Santa Fe	Do.
H. J. Hagerman	Roswell	Do.
Eusebio Chacon	Las Vegas	Do.
F. A. Jones	Albuquerque	Do.
Regents University of New Mexico (Albuquerque): [a]		
H. L. Waldo	Las Vegas	Sept. 2, 1903
J. H. Wroth, secretary and treasurer	Albuquerque	Sept. 2, 1904
E. S. Stover	do	Sept. 2, 1905
F. W. Clancy, president	do	Sept. 2, 1906
E. V. Chavez	do	Sept. 2, 1907
Regents New Mexico College of Agriculture and Mechanic Arts (Las Cruces): [a]		
H. B. Holt, secretary and treasurer	Las Cruces	Sept. 2, 1903
W. A. Cooper	Santa Fe	Sept. 2, 1904
G. A. Richardson, president	Roswell	Sept. 2, 1905
Seaman Field	Deming	Sept. 2, 1906
J. R. Lucero	Las Cruces	Sept. 2, 1907
Regents New Mexico Normal School (Silver City):		
Robert Black	Silver City	Feb. 18, 1904
W. G. Ritch, president	Engle	Feb. 18, 1905
J. Corbett	Deming	Feb. 18, 1906
Percy Wilson	Silver City	Feb. 18, 1907
E. M. Young, secretary and treasurer	do	Feb. 18, 1908
Regents, New Mexico Normal University (Las Vegas):		
A. B. Smith, secretary and treasurer	Las Vegas	Feb. 22, 1904
C. Ilfeld	do	Feb. 22, 1905
M. W. Browne, president	do	Feb. 22, 1906
C. A. Spiess	do	Feb. 22, 1907
W. R. Tipton	do	Feb. 22, 1908
Regents New Mexico School of Mines (Socorro):		
C. T. Brown, secretary and treasurer	Socorro	Sept. 2, 1903
F. G. Bartlett	Magdalena	Sept. 2, 1904
A. B. Fitch	do	Sept. 2, 1905
A. E. Rouillier	Paraje	Sept. 2, 1906
J. J. Baca, president	Socorro	Sept. 2, 1907
Regents New Mexico Military Institute (Roswell):		
J. C. Lea	Roswell	Mar. 22, 1904
Nathan Jaffa, president	do	Mar. 22, 1905
E. A. Cahoon, treasurer	do	Mar. 22, 1906
W. M. Reed, vice-president	do	Mar. 22, 1907
R. S. Hamilton, secretary	do	Mar. 22, 1908
Territorial board of education:		
The governor	Santa Fe	
The superintendent of public instruction	do	
President University of New Mexico	Albuquerque	Jan. 1, 1904
Maggie J. Bucher	Las Vegas	Jan. 1, 1905
President College of Agriculture and Mechanic Arts	Las Cruces	Jan. 1, 1906
President Silver City Normal School	Silver City	Jan. 1, 1907
President of St. Michaels College	Santa Fe	Jan. 1, 1908
Board of directors New Mexico Insane Asylum (Las Vegas): [a]		
Thomas Ross	Las Vegas	Sept. 2, 1903
O. L. Gregory	do	Sept. 2, 1904
M. Brunswick, secretary and treasurer	do	Sept. 2, 1905
J. Raynolds, president	do	Sept. 2, 1906
T. B. Hart, M. D	Raton	Sept. 2, 1907
Board of penitentiary commissioners:		
F. H. Pierce, president	Las Vegas	Mar. 17, 1905
W. H. Newcomb	Silver City	Do.
Juan Navarro, secretary	Mora	Do.
Louis Ilfeld	Albuquerque	Do.
Malaquias Martinez	Taos	Do.

[a] Governor and superintendent of public instruction advisory members.

Official register—Continued.

TERRITORIAL BOARDS AND INSTITUTIONS—Continued.

Name, etc.	Address.	Term expires.
Trustees Deaf and Dumb Asylum (Santa Fe):		
J. A. Wood	Santa Fe	July 22, 1904
G. Rivenburg	do	July 22, 1905
Francisco Delgado, secretary and treasurer	do	July 22, 1906
S. G. Cartwright	do	July 22, 1907
R. J. Palen, president	do	July 22, 1908
Trustees Institute for the Blind (Alamogordo):		
O. C. Snow	Las Cruces	Aug. 8, 1904
R. H. Pierce, secretary and treasurer	Alamogordo	Aug. 8, 1905
C. W. Gerber, M. D.	Las Cruces	Aug. 8, 1906
A. J. King, president	Alamogordo	Aug. 8, 1907
James Laurie	do	Aug. 8, 1908
Trustees Miners' Hospital (Raton):		
A. R. Streicher	Raton	June 20, 1904
W. S. Hopewell	Hillsboro	June 20, 1905
F. A. Manzanares, president	Las Vegas	June 20, 1906
D. J. Leahy	Raton	June 20, 1907
A. G. Dawson, secretary and treasurer	do	June 20, 1908
Trustees Reform School (El Rito):		
Frank Bond	Espanola	Aug. 11, 1904
J. H. Sloan, M. D., president	Santa Fe	Aug. 11, 1905
O. N. Marron	Ojo Caliente	Aug. 11, 1906
Venceslao Jaramillo, secretary and treasurer	El Rito	Aug. 11, 1907
T. D. Burns	Tierra Amarilla	Aug. 11, 1908
Board of Regents Orphan Children's Home (Belen):		
P. B. Dalles	Belen	Feb. 27, 1905
Solomon Luna	Los Lunas	Do.
John Becker	Belen	Do.
Board of control Albuquerque Armory:		
Capt. J. H. Stingle	Albuquerque	Apr. 6, 1904
Capt. M. O'Donnell	do	Apr. 6, 1905
Maj. J. E. Elder	do	Apr. 6, 1906
Col. John Borrodaile	do	Apr. 6, 1907
Board of control Las Vegas Armory:		
Lieut. R. H. Gross	Las Vegas	Apr. 6, 1904
Capt. H. M. Smith	do	Apr. 6, 1905
Capt. A. P. Tarkington	do	Apr. 6, 1906
Maj. R. C. Rankin	do	Apr. 6, 1907

THIRTY-FIFTH LEGISLATIVE ASSEMBLY—MEMBERS OF COUNCIL.

[January 19 to March 19, 1908.]

District.	Name.	Address.	Politics.
1. Colfax, Mora, Union	Saturnino Pinard	Clapham	Republican
2. San Miguel, Guadalupe	Chas. A. Spiess	Las Vegas	Do.
	James S. Duncan	do	Do.
3. Taos, Rio Arriba, San Juan	Venceslao Jaramillo	El Rito	Do.
	Malaquias Martinez	Taos	Do.
4. Santa Fe	Amado Chaves	Santa Fe	Do.
5. Bernalillo	Geo. F. Albright	Albuquerque	Do.
5. Bernalillo, McKinley	Thos. Hughes	do	Do.
6. Valencia	J. Francisco Chavez	Progreso	Do.
7. Socorro, Sierra	W. H. Andrews	Andrews	Do.
8. Doña Ana, Grant, Luna Otero	W. A. Hawkins	Alamogordo	Do.
9. Doña Ana, Grant, Lincoln, Luna, Chaves, Eddy, Otero.	A. B. Fall	Las Cruces	Do.

MEMBERS OF HOUSE.

1. Colfax	M. B. Stockton	Raton	Republican.
2. Mora	Cristoval Sanchez	Ocate	Do.
3. Union	W. F. McCash	Exter	Do.
4. San Miguel	Pedro Romero	Cabra Springs	Do.
	Gregorio Gutierres	Tecolote	Do.
	W. H. Coleman	Las Vegas	Do.
4. Guadalupe	Eduardo Martinez	Anton Chico	Democrat.
5. Santa Fe	Wm. Kilpatrick	Madrid	Republican.
	R. L. Baca	Santa Fe	Do.
6. Taos	Pedro Sanchez	Taos	Do.
7. Rio Arriba	Antonio D. Vargas	Ojo Caliente	Do.

Official register—Continued.

MEMBERS OF HOUSE—Continued.

District.	Name.	Address.	Politics.
8. Taos, Rio Arriba, San Juan	David Martinez, jr	Velarde	Republican.
	Granville Pendleton	Aztec	Do.
9. Bernalillo	Nestor Montoya	Albuquerque	Do.
	Celso Sandoval	Sandoval	Do.
9. Bernalillo, McKinley	Alex Bowie	Gallup	Do.
10. Valencia	Carl A. Dalies	Belen	Do.
	Martin Sanchez	Punta (Manzano)	Do.
11. Socorro, Sierra	H. H. Howard	San Marcial	Do.
	Domingo A. Ortega	Sabinal	Do.
12. Doña Ana, Otero	W. H. H. Llewellyn	Las Cruces	Do.
13. Grant, Luna	R. M. Turner	Silver City	Do.
14. Doña Ana, Grant, Luna, Otero	A. W. Pollard	Deming	Do.
15. Lincoln, Chaves, Eddy	W. A. McIvers	Nogal	Democrat.

OFFICERS OF THE COUNCIL.

J. Francisco Chaves	President
W. E. Martin	Chief clerk
E. E. Sidebottom	Enrolling and engrossing clerk
Thos. Branigan	Sergeant-at-arms
J. L. Gay	Chaplain
Benito Lujan	Messenger
Florencio Cortez	Watchman

OFFICERS OF THE HOUSE.

Nestor Montoya	Speaker
Chas. V. Safford	Chief clerk
O. P. Hovey	Enrolling and engrossing clerk
Seferino Crollett	Sergeant-at-arms
Rev. Adrian Rabeyrolle	Chaplain
Ramon Armijo	Messenger
Alejandro Mares	Watchman

Official register—Continued.

COUNTY OFFICERS, TERRITORY OF NEW MEXICO.

[Elected November 4, 1902.]

	Albuquerque, Bernalillo County.	Roswell, Chaves County.	Raton, Colfax County.	Las Cruces, Doña Ana County.
County commissioner:				
First district	Severo Sanchez[a]	T. D. White	E. N. Burch	Charles E. Miller.
Second district	T. C. Gutierrez	W. M. Atkinson	P. Y. Santistevan	S. Geck.
Third district	A. Harsh	A. M. Robertson	J. C. Taylor	Felix Torres.[a]
Probate judge	Jesus Romero	J. T. Evans	J. D. Fresquez	M. Valdez.
Probate clerk	J. A. Summers	F. P. Gayle	J. P. Brackett	I. Armijo.
Sheriff	T. S. Hubbell	F. Higgins	Marion Littrell	J. R. Lucero.
Assessor	George F. Albright	J. C. Peck	J. Hixenbaugh	T. Rouault.
Treasurer	F. A. Hubbell	M. Howell	G. J. Pace	O. Lohman.
Superintendent of schools	E. Vigil	J. McL. Gardiner	W. A. Chapman	A. Fountain.
Surveyor	D. J. Rankin	V. R. Kinney	P. M. Davenport	Geo. Lynch.

	Carlsbad, Eddy County.	Silver City, Grant County.	Santa Rosa, Leonard Wood County.[a]	Lincoln, Lincoln County.
County commissioner:				
First district	J. H. James	W. D. Murray	B. Padilla	Scipio Salazar.
Second district	C. Wilcox	J. C. Cureton	J. C. Thomas	S. C. Wiener.
Third district	N. W. Weaver	O. R. Smythe[a]	R. Harrison	P. L. Krause.
Probate judge	A. Green	L. H. Rowlee	F. Garcia	F. Gomez.
Probate clerk	W. R. Owen	W. B. Walton	M. B. Baca	L. Ellis.
Sheriff	M. C. Stewart	J. K. Blair	L. Casaus	R. Armstrong.
Assessor	J. O. McKeen	E. J. Schwartz	J. B. Giddings	Robert A. Hurt.
Treasurer	J. D. Walker	J. W. Fleming	L. Sanchez	E. M. Hulbert.
Superintendent of schools	M. P. Kerr	A. N. White	F. L. Braun	E. J. Coe.
Surveyor	B. A. Nymeyer	G. R. Brown		A. E. Williams.

[a] Officers appointed.

Official register—Continued

COUNTY OFFICERS, TERRITORY OF NEW MEXICO—Continued.

	Deming, Luna County.	Gallup, McKinley County.	Mora, Mora County.	Alamogordo, Otero County.
County Commissioner:				
First district	Wm. M. Taylor[a]	W. L. Bretherton	M. Maestas	O. D. Warnock.
Second district	S. S. Birchfield	W. H. Morris	F. A. Vigil	E. Prado.
Third district	W. C. Wallis	S. E. Aldrich	M. Lopez	J. C. Tucker.
Probate judge	E. H. Matthews	D. Apodaca	G. Rivera	R. Lopez.
Probate clerk	B. Y. McKeyes	F. W. Meyers	E. H. Bierbaum	W. K. Stalcup.
Sheriff	W. H. Foster	W. A. Smith	T. Melendez	J. Hunter.
Assessor	J. B. Hodgdon	S. Canavan	A. Medina	T. F. Fleming.
Treasurer	W. H. Guiney	J. C. Spears	R. Roybal	I. N. Jackson.
Superintendent of schools	U. F. Duff	Jos. A. Codington[a]	R. Romero	J. E. Edgington.
Surveyor	N. J. Lloyd	Wm. McVicker	W. H. Garner	J. E. Edgington.[a]

	Tierra Amarilla, Rio Arriba County.	Portales, Roosevelt County.[a]	Tucumcari, Quay County.[a]	Sandoval, Sandoval County.[a]
County commissioner:				
First district	F. A. Serna	W. O. Oldham	Isaac Barnes	E. A. Miera.
Second district	A. C. de Baca	R. Hicks	J. P. Martinez	E. Baca.
Third district	V. Valdez	B. Blankinship	A. D. Goldenberg	I. Gutierrez.
Probate judge	J. P. Lujan	C. L. Carter	T. W. Heman	Nicolas de la O.
Probate clerk	B. C. Hernandez	W. E. Lindsey	N. V. Gallegos	O. P. Hovey.
Sheriff	A. Read	W. W. Odom	J. A. Street	F. J. Otero.
Assessor	E. P. Jaquez[a]	C. O. Leach	D. Stewart	M. Baca.
Treasurer	P. Esquibel	W. K. Breeding	H. R. Neal	V. S. Miera.
Superintendent of schools	S. Roybal	J. C. Llewellyn	M. Rudolph	J. B. Archuleta.
Surveyor	J. P. Rinker	J. A. Fairly	J. Campbell	

	Aztec, San Juan County.	Las Vegas, San Miguel County.	Santa Fe, Santa Fe County.	Hillsboro, Sierra County.
County commissioner:				
First district	J. V. Lujan	J. F. Esquibel	Arthur Seligman	U. P. Arrey.[a]
Second district	J. R. Williams	R. Gallegos	A. L. Kendall	T. Murphy.
Third district	J. E. McCarty	A. T. Rogers	N. Quintana	V. Trujillo.
Probate judge	M. Garcia	S. Baca	M. Castillo	P. Torres.
Probate clerk	J. Prewitt	A. A. Sena	C. Lopez	J. M. Webster.[a]
Sheriff	J. E. Elmer	C. Romero	H. C. Kinsell	M. L. Kahler.
Assessor	B. C. Vaughan	F. A. Chavez	M. A. Ortiz	A. Kelley.
Treasurer	A. G. Black	E. Romero	G. W. Knaebel	J. C. Plemmons.
Superintendent of schools	O. C. McEwen	J. M. Quintana	J. V. Conway	F. Luna y Garcia,
Surveyor	Charles Holley	A. Fresquez	A. J. Griffin	A. Preisser.

	Socorro, Socorro County.	Taos, Taos County.	Clayton, Union County.	Los Lunas, Valencia County.
County commissioner:				
First district	C. Jojola	A. Gusdorf	C. Otto	A. Padilla.
Second district	A. Contreras	M. A. Chacon	J. B. Montoya	R. Jaramillo.
Third district	C. Padilla	H. Romero	E. Gallegos	R. Garcia.
Probate judge	M. Miera	L. Dominguez	E. Lobato	H. Chavez.
Probate clerk	B. A. Pino	T. M. y Gonzales	R. P. Martinez	D. Vallejos.
Sheriff	L. Baca	F. Trujillo	P. Baca y Sanchez	Carlos Baca.
Assessor	B. Sanchez	A. Santistevan	L. Vigil	B. W. Bibo.
Treasurer	H. G. Baca	T. Sanchez	J. M. Gonzales	S. Luna.
Superintendent of schools	A. C. Torres	A. B. Trujillo	L. Castillo	J. C. Sanchez.
Surveyor	W. W. Jones	F. Santistevan	F. Garcia	R. G. Marmon.

[a] Officers appointed.

TABLE II.—*Official canvass of vote, by counties, for Delegate to Congress, general election, November 4, 1902.*

County.	B. S. Rodey, Republican.	H. B. Ferguson, Democrat.	Majority.	
			B. S. Rodey.	H. B. Ferguson.
Bernalillo	3,818	421	3,397	
Chaves	359	883		524
Colfax	1,450	1,027	423	
Doña Ana	1,221	469	752	
Eddy	194	456		262
Grant	849	878		29
Guadalupe	773	591	182	
Lincoln	767	675	92	
Luna	261	243	18	
McKinley	390	174	216	
Mora	1,128	997	131	
Otero	692	474	218	
Rio Arriba	1,752	899	853	
San Juan	346	390		44
San Miguel	2,794	1,984	810	
Santa Fe	1,630	1,116	514	
Sierra	426	379	47	
Socorro	1,483	967	516	
Taos	1,159	786	373	
Union	782	711	21	
Valencia	1,998	56	1,942	
Total	24,222	14,576	10,505	859

Total majority for Bernard S. Rodey	9,646
Total vote:	
1900	39,414
1902	38,798
Decrease	616

TABLE III.—*Corporation filings for fiscal years 1902–3.*

Foreign.	1902.		1903.	
	Number.	Authorized capital.	Number.	Authorized capital.
Arizona	5	$2,925,000		
California	1	100,000	3	$40,000
Colorado	3	805,000	8	3,260,000
Delaware			1	1,000,000
Illinois	1	40,000		
Indiana	1	12,000		
Iowa			1	42,000
Kansas	2	110,000		
Maine	1	1,000,000		
Maryland	3	1,750,000	1	4,000,000
Missouri	1	350,000	3	204,000
New Jersey	1	10,000	1	8,000,000
New York	2	2,750,000	1	1,400,000
Rhode Island	1	250,000		
South Dakota	1	1,000,000	4	6,500,000
Texas			2	165,000
West Virginia	2	300,000	1	3,000,000
Wisconsin			2	2,000,000
Wyoming	1	250,000	1	1,000,000
	26	11,652,000	29	30,611,000
Domestic	178	107,794,500	171	69,918,541
Total	204	119,446,500	200	100,529,541

TABLE IV.—*Character of corporation charters issued for the fiscal years 1902–3.*

Character.	1902.			1903.		
	Number.	Capital.	Mileage.	Number.	Capital.	Mileage.
Banks and building and loan associations	6	$4,820,000	.....	4	$6,240,000	.....
Benevolent and charitable institutions	10	.....	.....	9	.....	.....
Irrigation and improvement companies	10	2,011,000	.....	7	1,500,000	.....
Manufacturing and other industrial pursuits	63	4,796,500	.....	104	18,079,541	.....
Mining, milling, and smelting companies	110	101,619,000	.....	70	59,435,000	.....
Railway companies	5	6,200,000	449	6	15,275,000	698
Total	204	119,446,500	449	200	100,529,541	698

TABLE V.—*Incorporation fees paid Territorial treasurer for fiscal years 1902–3.*

Quarter.	1902.	1903.
First	$3,288.50	$3,071.75
Second	2,600.50	3,608.75
Third	2,659.00	5,168.00
Fourth	2,158.00	1,780.00
Total	10,706.00	13,628.50

REPORT OF TREASURER OF THE TERRITORY.

By J. H. VAUGHN.

The bonded indebtedness of the Territory (June 1, 1903) is $1,098,300, showing a reduction in the past year of $25,000; arising from provisional-indebtedness bonds bought, $10,000; certificates of indebtedness paid, $15,000.

Certificates of indebtedness to the amount of $10,600 having been called for payment are still outstanding and unpaid, not having been presented for payment. Interest on this amount ($10,600) ceased on March 1, 1903.

There is now in the treasury to the credit of sinking funds available to redeem outstanding Territorial bonds $134,590.03.

The revenues derived from the 6-mill tax levied for Territorial purposes has been ample to meet all current expenses provided for under the appropriations, and the present financial condition of the Territory is most gratifying.

Payments, by counties, of Territorial tax for year ending June 1, 1903.

County.	Fifty-third fiscal year.		Fifty-fourth fiscal year.		Total payments.
	Third quarter.	Fourth quarter.	First quarter.	Second quarter.	
Bernalillo	$15,914.87	$1,933.47	$20,396.02	$332.32	$38,576.68
Chaves	16,251.76	718.51	18,363.28	997.10	36,330.65
Colfax	13,802.51	1,581.32	18,042.36	1,119.32	34,545.51
Doña Ana	7,678.92	.....	12,982.08	1,546.15	22,207.15
Eddy	10,578.00	581.91	11,977.04	937.96	24,074.91
Grant	15,158.82	1,477.20	20,434.03	1,144.94	38,214.99
Guadalupe	2,226.00	153.92	6,087.93	422.82	8,890.67
Lincoln	6,981.02	1,901.73	7,609.17	560.13	17,052.05
Luna	8,191.95	58.10	9,600.37	96.09	17,946.51
McKinley	3,032.28	3,974.59	1,565.09	476.19	9,048.15
Mora	4,253.55	75.60	4,772.28	163.48	9,264.91
Otero	5,625.36	693.17	7,763.68	426.30	14,508.51
Rio Arriba	3,268.63	.....	5,016.62	118.32	8,403.57
San Juan	1,015.40	662.43	3,284.70	652.40	5,614.93
Santa Fe	7,043.34	1,706.61	9,467.00	882.98	19,099.93
San Miguel	18,114.57	471.60	19,570.37	892.71	39,049.25
Sierra	7,128.18	1,134.88	8,408.79	458.55	17,130.40
Socorro	7,904.24	286.14	7,193.85	1,064.01	16,448.24
Taos	2,210.82	536.09	3,229.20	261.11	6,236.72
Union	9,584.19	930.70	13,339.04	2,309.87	26,163.80
Valencia	3,202.44	564.73	6,736.82	810.54	10,814.53
Total	169,166.35	19,442.70	215,839.72	15,173.29	419,622.06

Receipts from sources other than taxation for year ending June 1, 1903.

Source from which received.	Fifty-third fiscal year.		Fifty-fourth fiscal year.		Total receipts.
	Third quarter.	Fourth quarter.	First quarter.	Second quarter.	
Sale of compiled laws	$119.00	$76.50	$102.00	$51.00	$348.50
H. O. Bursum, superintendent penitentiary, convicts' earnings	4,808.32	4,600.15	3,607.61	2,568.14	15,584.22
J. H. Vaughn, Territorial treasurer, interest on deposits	1,430.46	1,540.91	1,626.09	1,702.27	6,299.73
J. A. La Rue, secretary cattle sanitary board	1,000.00	3,500.00	1,000.00	3,000.00	8,500.00
J.W. Raynolds, Territorial secretary, fees from office	2,158.00	3,071.75	3,608.75	5,168.00	14,006.50
Clerks of district courts, fees	3,122.55	2,164.30	2,871.87	2,241.86	10,400.58
A. A. Keen, commissioner public lands	2,722.17	12,910.59	8,917.03	47,500.71	72,050.50
J. S. Clark, Territorial coal-oil inspector	725.00	.....	.....	.....	725.00

Receipts from sources other than taxation for year ending June 1, 1903—Continued.

Sources from which received.	Fifty-third fiscal year.		Fifty-fourth fiscal year.		Total receipts.
	Third quarter.	Fourth quarter.	First quarter.	Second quarter.	
C. V. Safford, chief clerk house of representatives, Thirty-fifth legislative assembly				$5.55	$5.55
Sol. Spiegelberg, treasurer Santa Fe County	$20.47				20.47
United States annual appropriation for agricultural college	25,000.00				a 25,000.00
Pullman Palace Car Company				400.20	400.20
W. G. Sargent, Territorial auditor		$20.00			20.00
R. J. Palen, treasurer exposition fund				3,427.55	3,427.55
Total	41,105.97	27,884.20	$21,733.35	66,065.28	156,788.80

RECAPITULATION.

From county collectors, tax levies	169,166.35	19,442.70	215,839.72	15,173.29	419,622.06
Sources other than taxation	41,105.97	27,884.20	21,733.35	66,065.28	156,788.80
Total	210,272.32	47,326.90	237,573.07	81,238.57	576,410.86

a Transmitted by Treasurer of the United States through Territorial treasurer to college, and not being Territorial funds not reported to auditor.

Quarterly statement of the Territorial treasurer of New Mexico, third quarter of the fifty-third fiscal year, commencing June 1, 1902, and ending August 31, 1902.

Title of fund or account.	Balances, June 1, 1902.	Receipts during quarter.	Transfers to funds.	Transfers from funds.	Payments during quarter.	Balances, Aug. 31, 1902.
Interest fund	$22,484.16		$30,065.20		$16,775.00	$35,774.36
School fund		$725.00				725.00
Interest on deposits	2,696.88	1,430.46				4,127.34
Interest and sinking fund, certificate of indebtedness		11,089.76		$5,956.82		5,132.94
University of New Mexico	1,262.74		6,094.61		5,714.03	1,643.32
University of New Mexico deficiency fund	573.92		2,770.28		2,597.23	746.97
Agricultural college	3,284.93		2,216.22		3,284.93	2,216.22
Agricultural college income fund		12.69				12.69
Reform school income fund		262.74				262.74
Blind asylum income fund		278.42				278.42
New Mexico School of Mines	2,039.12		3,656.77		5,389.72	306.17
School of Mines income fund		312.83			312.83	
Deaf and dumb asylum income fund		273.50				273.50
Miners' hospital income fund		262.76				262.76
New Mexico Insane Asylum	1,050.58		11,081.11		9,143.84	2,987.85
Insane asylum income fund		267.86				267.86
Penitentiary income fund		263.26				263.26
Deaf and dumb asylum	72.80					72.80
Military institute income fund		262.70				262.70
New Mexico military institute	2,162.69		3,878.39		4,995.83	1,045.75
Compilation fund	658.10	119.00				777.10
Normal school, Silver City, income fund		262.71				262.71
Normal school, N. Mex. (Silver City)	463.75		3,545.95		2,276.12	1,733.58
Normal school, Las Vegas, income fund		262.70				262.70
Normal school, Las Vegas	525.28		5,540.56		4,571.91	1,493.93
Special purposes	883.63	3,326.48			1,155.28	3,054.83
Compensation of assessors	2,025.99	7,053.70			6,348.90	2,730.79
Springfield Fire and Marine Ins. Co.a	7,500.00					7,500.00
Pullman Company tax fund	333.73				333.73	
Legal-expense fund	192.60					192.60
Special-tax fund, fiftieth fiscal year	357.97					357.97
Common school income	7,690.13				3,239.40	4,450.73
Proceeds 5 per cent United States land sales	4,715.95					4,715.95
Charitable institutions	3,226.15	6,586.35			5,265.28	4,497.22
Deficit fund	154.60					154.60
Sheep sanitary fund	1,114.46	1,048.66			1,708.40	454.72

a Deposited by the Springfield Fire and Marine Insurance Company for benefit and security of its policy holders residing in New Mexico.

Quarterly statement of the Territorial treasurer of New Mexico, third quarter of the fifty-third fiscal year, commencing June 1, 1902, and ending August 31, 1902—Continued.

Title of fund or account.	Balances, June 1, 1902.	Receipts during quarter.	Transfers to funds.	Transfers from funds.	Payments during quarter.	Balances, Aug. 31, 1902.
Territorial institutions, fifty-first fiscal year		$74.57		$74.57		
Penitentiary current-expense fund	$1,524.39		$4,041.96		$2,654.97	$2,911.38
Penitentiary maintenance fund	316.65		11,801.04		8,358.17	3,264.52
Penitentiary convicts' earnings fund	319.35	4,808.32			4,798.93	333.74
Salary fund	20,568.22	8,122.55	16,900.71		11,142.27	29,349.21
Supreme court fund	608.47		149.60			758.07
Miscellaneous fund	9,089.45	20.47	8,738.60		4,878.53	12,974.69
Militia fund	486.00		790.54		343.49	933.05
Capitol contingent-expense fund	1,121.58		2,693.51		1,509.93	2,305.16
Capitol maintenance fund	.95					.95
United States annual appropriation, college of agriculture		25,000.00			25,000.00	(a)
Territorial purposes, fifty-second fiscal year		528.06		528.06		
Territorial institutions, fifty-second fiscal year		273.02		273.02		
Capitol building bonds sinking fund	69,103.02	16,654.03				85,757.05
Provisional indebtedness bond sinking fund	20,143.24	5,534.35				25,677.59
Insane asylum permanent fund	2,377.09					2,377.09
Penitentiary permanent fund	1,430.96				85.27	1,345.69
Territorial purposes, fifty-third fiscal year		68,096.28	528.06	68,624.34		
Blind asylum permanent fund	32.14					32.14
Deaf and dumb asylum permanent fund	12,686.71				12,686.71	
Territorial institutions, fifty-third fiscal year		38,436.30	347.59	38,783.89		
Geological survey	3,740.99	2,749.99				6,490.98
Exposition fund	1,978.74	4,391.33				6,370.07
Capitol contingent bond sinking fund	2,244.48	2,805.31				5,049.79
Cattle indemnity fund	1,514.26	3,726.16			4,883.11	357.31
Total	215,251.85	210,272.32	114,240.70	114,240.70	149,438.61	276,085.56

(a) Annual appropriation by United States to Agricultural College; not being Territorial funds, not reported to auditor.

RECAPITULATION.

Balances, June 1, 1902	$215,251.85
Receipts during quarter	210,272.32
Total to be accounted for	425,524.17
Payments during quarter	149,438.61
Balance, August 31, 1902	276,085.56

DISPOSITION OF FUNDS.

First National Bank of Santa Fe	$46,749.17
Bank of Commerce, Albuquerque	28,071.77
First National Bank of Las Vegas	30,076.28
First National Bank of Albuquerque	30,080.92
Taos County Bank, Taos	(a) 7,160.42
New Mexico Savings Bank and Trust Co., Albuquerque	(a) 781.19
San Miguel National Bank, Las Vegas	30,064.50
First National Bank of Raton	15,039.12
First National Bank of Roswell	15,039.62
National Bank of Commerce of New York	17,870.29
Citizens' Bank, Roswell	15,061.80
First National Bank, Clayton	20,050.00
First National Bank, Carlsbad	20,050.48
Total	276,085.56

I certify the foregoing statement to be true and correct.

J. H. VAUGHN,
Territorial Treasurer.

SANTA FE, N. MEX., *September 1, 1902.*

(a) Funds not available.

Quarterly statement of the Territorial treasurer of New Mexico, fourth quarter of the fifty-third fiscal year, commencing September 1, 1902, and ending November 30, 1902.

Title of fund or account.	Balances, Sept. 1, 1902.	Receipts during quarter.	Transfers to funds.	Transfers from funds.	Payments during quarter.	Balances, Nov. 30, 1902.
Interest fund	$35,774.36	.....	$2,706.74	.....	$15,340.00	$23,141.10
School fund	725.00	.....	.....	.....	.....	725.00
Interest on deposits	4,127.34	$1,540.91	.....	.....	.....	5,668.25
Interest and sinking fund, certificate of indebtedness	5,132.94	1,293.56	.....	.....	2,518.00	3,908.50
University of New Mexico	1,643.32	.....	418.29	.....	1,643.32	418.29
Deficiency fund	746.97	.....	190.11	.....	746.97	190.11
Agricultural college	2,216.22	.....	152.09	.....	2,263.68	104.63
Agricultural college income fund	12.69	60.47	.....	.....	.....	73.16
Reform school income fund	262.74	74.10	.....	.....	.....	336.84
Blind asylum income fund	278.42	115.35	.....	.....	.....	393.77
New Mexico School of Mines	306.17	.....	250.94	.....	.....	557.11
School of Mines income fund	.....	75.63	.....	.....	.....	75.63
Deaf and dumb asylum income fund	273.50	72.50	.....	.....	.....	346.00
Miners' hospital income fund	262.76	73.90	.....	.....	.....	336.66
New Mexico insane asylum	2,987.85	.....	760.45	.....	2,987.85	760.45
Insane asylum income fund	267.86	90.66	.....	.....	.....	358.52
Penitentiary income fund	263.26	88.47	.....	.....	290.83	60.90
Deaf and dumb asylum	72.80	.....	.....	.....	.....	72.80
Military institute income fund	262.70	74.18	.....	.....	.....	336.88
Water reservoir income fund	.....	615.57	.....	.....	615.57	.....
Water reservoir permanent fund	.....	60.00	.....	.....	.....	60.00
New Mexico military institute	1,045.75	.....	266.15	.....	1,128.79	183.11
Compilation fund	777.10	76.50	.....	.....	.....	853.60
Normal school (Silver City) income fund	262.71	75.30	.....	.....	.....	338.01
Normal school, N. Mex. (Silver City)	1,733.58	.....	243.34	.....	834.30	1,142.62
Normal school (Las Vegas) income fund	262.70	75.30	.....	.....	.....	338.00
Normal school (Las Vegas)	1,493.93	.....	380.22	.....	.....	1,874.15
Special purposes	3,054.83	377.97	.....	.....	2,191.03	1,241.77
Springfield Fire and Marine Insurance Co.[a]	7,500.00	.....	.....	.....	7,500.00	.....
Legal-expense fund	192.60	.....	.....	.....	.....	192.60
Special-tax fund, fiftieth fiscal year	357.97	.....	.....	.....	.....	357.97
Common school income	4,450.73	11,308.49	.....	.....	1,360.66	14,398.56
Proceeds 5 per cent United States land sales	4,715.95	.....	.....	.....	.....	4,715.95
Charitable institutions	4,497.22	757.85	.....	.....	2,490.59	2,764.48
Deficit fund	154.60	.....	.....	.....	.....	154.60
Sheep sanitary fund	454.72	125.34	.....	.....	.....	580.06
Territorial institutions, fifty-first fiscal year	.....	21.66	.....	$21.66	.....	.....
Penitentiary current-expense fund	2,911.38	.....	453.80	.....	2,654.97	710.21
Compensation of assessors	2,730.79	814.61	.....	.....	1,519.38	2,026.02
Penitentiary maintenance fund	3,264.52	.....	1,268.79	.....	4,264.82	268.49
Penitentiary convicts' earnings fund	833.74	4,600.15	.....	.....	4,463.90	969.99
Salary fund	29,349.21	2,164.30	1,886.23	.....	10,725.54	22,674.20
Supreme court fund	753.07	.....	16.79	.....	11.45	758.41
Miscellaneous fund	12,974.69	.....	981.09	.....	2,889.70	11,066.08
Militia fund	933.05	.....	88.76	.....	231.79	790.02
Capitol contingent-expense fund	2,305.16	.....	302.39	.....	1,906.68	700.87
Capitol maintenance fund	.95	.....	.....	.....	.....	.95
Territorial purposes, fifty-second fiscal year	.....	940.45	.....	940.45	.....	.....
Territorial institutions, fifty-second fiscal year	.....	489.96	.....	489.96	.....	.....
Provisional indebtedness, bond sinking fund	25,677.59	644.15	.....	.....	.....	26,321.74
Insane asylum permanent fund	2,377.09	.....	.....	.....	.....	2,377.09
Penitentiary permanent fund	1,345.69	.....	.....	.....	533.65	812.04
Capitol building bonds, sinking fund	85,757.05	2,003.74	.....	.....	.....	87,760.79
Territorial purposes, fifty-third fiscal year	.....	6,764.14	940.45	7,704.59	.....	.....
Territorial institutions, fifty-third fiscal year	.....	2,149.97	511.62	2,661.59	.....	.....
Blind asylum permanent fund	32.14	.....	.....	.....	.....	32.14
Geological survey	6,490.98	282.96	.....	.....	.....	6,773.94
Exposition fund	6,370.07	450.34	.....	.....	.....	6,820.41
Capitol contingent bond sinking fund	5,049.79	235.51	.....	.....	.....	5,285.30
Cattle indemnity fund	357.31	3,761.62	.....	.....	3,849.36	269.57
Territorial purposes, fifty-fourth fiscal year	.....	3,094.68	.....	.....	.....	3,094.68
Territorial institutions, fifty-fourth fiscal year	.....	1,805.94	.....	.....	.....	1,805.94
University of New Mexico income	.....	70.67	.....	.....	.....	70.67
Total	276,085.56	47,326.90	11,818.25	11,818.25	74,962.83	248,449.63

[a] Deposited by the Springfield Fire and Marine Insurance Company for benefit and security of its policy holders residing in New Mexico.

RECAPITULATION.

Balances September 1, 1902	$276,085.56
Receipts during quarter	47,326.90
Total to be accounted for	323,412.46
Payments during quarter	74,962.83
Balance November 30, 1902	248,449.63

DISPOSITION OF FUNDS.

First National Bank of Santa Fe	$31,312.68
Bank of Commerce, Albuquerque	28,000.00
First National Bank of Las Vegas	30,000.00
First National Bank of Albuquerque	30,000.00
San Miguel National Bank, Las Vegas	30,000.00
First National Bank of Raton	15,000.00
First National Bank of Roswell	15,000.00
National Bank of Commerce of New York	8,582.14
Citizens Bank, Roswell	15,000.00
First National Bank, Clayton	20,000.00
First National Bank, Carlsbad	20,000.00
Taos County Bank, Taos	a4,773.62
New Mexico Savings Bank and Trust Company, Albuquerque	a781.19
Total	248,449.63

I certify the foregoing statement to be true and correct.

J. H. VAUGHN,
Territorial Treasurer.

SANTA FE, N. MEX., *December 1, 1902.*

Quarterly statement of the Territorial treasurer of New Mexico, first quarter of the fifty-fourth fiscal year, commencing December 1, 1902, and ending February 28, 1903.

Title of fund or account.	Balances Dec. 1, 1902.	Receipts during quarter.	Transfers to funds.	Transfers from funds.	Payments during quarter.	Balances Feb. 28, 1903.
Interest fund	$23,141.10	.....	$32,325.83	.....	$15,605.00	$39,861.93
School fund	725.00	.....	.....	.....	.....	725.00
Interest on deposits	5,668.25	$1,626.09	.....	.....	5,824.00	1,470.34
Interest and sinking fund, certificate of indebtedness	3,908.50	14,224.32	.....	.....	.....	18,132.82
University of New Mexico	418.29	.....	8,113.76	.....	7,172.97	1,359.08
University of New Mexico, deficiency fund	190.11	.....	3,688.07	.....	3,260.41	617.77
Agricultural college	104.63	.....	2,960.46	.....	.....	3,055.09
Agricultural college income fund	73.16	61.41	.....	.....	.....	134.57
Reform school income fund	336.84	19.03	.....	.....	.....	355.87
Blind asylum income fund	393.77	19.13	.....	.....	.....	412.90
New Mexico school of mines	557.11	.....	4,868.26	.....	4,609.91	815.46
School of mines income fund	75.63	149.64	.....	.....	.....	225.27
Deaf and dumb asylum income fund	346.00	39.43	.....	.....	.....	385.43
Miners' hospital income fund	336.66	19.03	.....	.....	.....	355.69
New Mexico insane asylum	760.45	.....	14,752.24	.....	8,868.24	6,644.45
Insane asylum income fund	358.52	84.25	.....	.....	.....	442.77
Penitentiary income fund	60.90	33.36	.....	.....	.....	94.26
Deaf and dumb asylum	72.80	.....	.....	.....	.....	72.80
Military institute income fund	336.88	19.25	.....	.....	.....	356.13
Water reservoir income fund	.....	.....	.....	.....	.....	.....
Water reservoir permanent fund	60.00	.....	.....	.....	.....	60.00
New Mexico military institute	183.11	.....	5,163.31	.....	4,481.14	865.28
Compilation fund	853.60	102.00	.....	.....	.....	955.60
Normal school, Silver City, income fund	338.01	20.83	.....	.....	.....	358.84
Normal school, Las Vegas, income fund	338.00	20.83	.....	.....	358.83	.....
Normal school, New Mexico (Silver City)	1,142.62	.....	4,720.75	.....	3,834.75	2,028.62
Normal school, Las Vegas	1,874.15	.....	7,376.15	.....	5,928.05	3,322.25
Special purposes	1,241.77	3,610.02	.....	.....	1,828.76	3,023.03
Legal expense fund	192.60	.....	.....	.....	.....	192.60
Special tax fund, fiftieth fiscal year	357.97	.....	.....	.....	.....	357.97
Common school income	14,398.56	6,030.84	.....	.....	553.59	19,875.81
Proceeds 5 per cent United States land sales	4,715.95	.....	.....	.....	.....	4,715.95
Charitable institutions	2,764.48	8,419.36	.....	.....	3,867.09	7,316.75

a Funds not available.

Quarterly statement of the Territorial treasurer of New Mexico, first quarter of the fifty-fourth fiscal year, etc.—Continued.

Title of fund or account.	Balances, Dec. 1, 1902.	Receipts during quarter.	Transfers to funds.	Transfers from funds.	Payments during quarter.	Balances, Nov. 30, 1902.
Deficit fund	$154.60					$154.60
Sheep sanitary fund	580.06	$1,446.68			$580.06	1,446.68
Territorial institutions, fifty-first fiscal year		34.95		$34.95		
Penitentiary current expense fund	710.21		$5,419.52		2,488.52	3,641.21
Compensation of assessors	2,026.02	8,987.36			7,569.09	3,444.29
Penitentiary maintenance fund	268.49		15,155.64		11,287.36	4,136.77
Penitentiary convicts earnings fund	969.99	3,607.61			4,266.32	311.28
Salary fund	22,674.20	2,871.87	16,293.79		10,905.67	30,934.19
Supreme court fund	758.41		145.10		207.25	696.26
Miscellaneous fund	11,066.08		8,475.53		4,243.82	15,297.79
Militia fund	790.02		766.75		231.61	1,325.16
Capitol contingent expense fund	700.87		2,613.36		2,311.79	1,002.44
Territorial purposes, fifty-second fiscal year		239.60		239.60		
Territorial institutions, fifty-second fiscal year		123.81		123.81		
Provisional indebtedness bond sinking fund	26,321.74	7,154.67				33,476.41
Insane asylum permanent fund	2,377.09					2,377.09
Capitol building bonds sinking fund	87,760.79	21,371.37				109,132.16
Territorial purposes, fifty-third fiscal year		3,396.96		3,396.96		
Territorial institutions, fifty-third fiscal year		1,987.00		1,987.00		
Blind asylum permanent fund	32.14					32.14
Geological survey	6,773.94	3,551.21				10,325.15
Exposition fund	6,820.41	5,694.29				12,514.70
Capitol contingent bond sinking fund	5,285.30	168.18			3,396.00	2,058.48
Cattle indemnity fund	269.57	7,076.38			5,071.07	2,274.88
Territorial purposes, fifty-fourth fiscal year	3,094.68	85,281.01	3,686.56	81,194.57	5,805.50	5,012.18
Territorial institutions, fifty-fourth fiscal year	1,805.94	47,681.30	2,145.76	51,633.00		
University of New Mexico income	70.67				70.67	
Capitol maintenance fund	.95			.95		
Penitentiary permanent fund	812.04				363.00	449.04
Normal university, Las Vegas, permanent		1,200.00			1,200.00	
Normal school, Silver City, permanent		1,200.00				1,200.00
Total	248,449.63	237,573.07	138,610.84	138,610.84	126,189.47	359,833.23

RECAPITULATION.

Balances, December 1, 1902	$248,449.63
Receipts during quarter	237,573.07
Total to be accounted for	486,022.70
Payments during quarter	126,189.47
Balance, March 1, 1903	359,833.23

DISPOSITION OF FUNDS.

First National Bank of Santa Fe	$112,974.89
Bank of Commerce, Albuquerque	25,215.92
First National Bank of Las Vegas	30,231.27
First National Bank of Albuquerque	30,226.40
San Miguel National Bank, Las Vegas	30,225.75
First National Bank of Raton	15,113.58
First National Bank of Roswell	15,113.17
National Bank of Commerce of New York	16,677.44
Citizens Bank, Roswell	15,114.00
First National Bank, Clayton	20,150.00
First National Bank, Carlsbad	20,150.90
Silver City National Bank	20,085.10
Taos County Bank, Taos	[a] 4,773.62
New Mexico Savings Bank and Trust Company, Albuquerque	[a] 781.19
Total	359,833.23

I certify the foregoing statement to be true and correct.

J. H. VAUGHN,
Territorial Treasurer.

SANTA FE, N. MEX., *March 1, 1903.*

[a] Funds not available.

Quarterly statement of the Territorial treasurer of New Mexico, second quarter of the fifty-fourth fiscal year, commencing March 1, 1903, and ending May 31, 1903.

Title of fund or account.	Balances, Feb. 28, 1903.	Receipts during quarter.	Transfers to funds.	Transfers from funds.	Payments during quarter.	Balances, May 31, 1903.
Interest fund	$39,861.93	.....	$3,688.67	$5,000.00	$15,862.50	$22,688.10
School fund	725.00	.....	.....	.....	.....	725.00
Interest on deposits	1,470.34	$1,702.27	5,000.00	5,000.00	1,871.99	1,300.62
Interest and sinking fund, certificate of indebtedness	18,132.82	983.15	14.30	.....	15,479.00	3,651.27
University of New Mexico	1,359.08	.....	549.32	.....	1,359.08	549.32
University of New Mexico, deficiency fund	617.77	.....	249.69	.....	617.77	249.69
Agricultural college	3,055.09	.....	199.76	.....	3,098.62	156.23
Agricultural college income fund	134.57	.....	.....	.....	101.38	33.19
Reform school income fund	355.87	.....	.....	100.00	.....	255.87
Blind asylum income fund	412.90	.....	.....	100.00	.....	312.90
New Mexico School of Mines	815.46	.....	329.59	.....	815.46	329.59
School of mines income fund	225.27	.....	.....	.....	.....	225.27
Deaf and dumb asylum income fund	385.43	.....	.....	.....	.....	385.43
Miners' hospital income fund	355.69	32.00	.....	100.00	.....	287.69
New Mexico insane asylum	6,644.45	.....	998.79	.....	6,644.45	998.79
Insane asylum income fund	442.77	.....	.....	.....	442.77	.....
Penitentiary income fund	94.26	.....	.....	.....	85.62	8.64
Deaf and dumb asylum	72.80	.....	.....	.....	.....	72.80
Military institute income fund	356.13	.....	.....	100.00	.....	256.13
Water reservoir income fund	.....	.....	.....	.....	.....	.....
Water reservoir permanent fund	60.00	.....	.....	.....	.....	60.00
New Mexico military institute	865.28	.....	349.57	.....	941.46	273.39
Compilation fund	955.60	51.00	.....	.....	955.60	51.00
Normal school, Silver City, income fund	358.84	.....	.....	100.00	.....	258.84
Normal school, Las Vegas, income fund	.....	.....	.....	.....	.....	.....
Normal school, New Mexico (Silver City)	2,028.62	.....	319.61	.....	1,522.18	826.05
Normal school, Las Vegas	3,322.25	.....	499.39	.....	3,322.25	499.39
Special purposes	3,023.03	2,389.28	3.58	.....	801.41	4,614.48
Legal-expense fund	192.60	.....	.....	.....	.....	192.60
Special-tax fund, fiftieth fiscal year	357.97	.....	.....	.....	350.00	7.97
Common school income	19,875.81	3,506.01	500.00	500.00	18,989.19	4,392.63
Proceeds 5 per cent United States land sales	4,715.95	2,026.26	.....	.....	.....	6,742.21
Charitable institutions	7,316.75	581.80	8.44	.....	3,944.99	3,962.00
Deficit fund	154.60	.....	.....	.....	.....	154.60
Sheep sanitary fund	1,446.68	230.86	.....	.....	1,485.67	191.87
Territorial institutions, fifty-first fiscal year	.....	15.30	.....	15.30	.....	.....
Penitentiary current-expense fund	3,641.21	.....	618.43	.....	2,679.96	1,579.68
Compensation of assessors	3,444.29	632.38	4.51	.....	1,882.45	2,198.73
Penitentiary maintenance fund	4,136.77	.....	6,729.09	.....	10,202.80	663.06
Penitentiary convicts' earnings fund	311.28	2,568.14	.....	.....	2,460.79	418.63
Salary fund	30,934.19	2,241.86	2,570.57	.....	17,506.43	18,240.19
Supreme-court fund	696.26	.....	22.89	.....	10.00	709.15
Miscellaneous fund	15,297.79	.....	1,337.05	.....	3,959.05	12,675.79
Militia fund	1,325.16	.....	120.97	.....	587.84	858.29
Capitol contingent-expense fund	1,002.44	1,000.00	412.11	.....	2,186.50	228.05
Territorial purposes, fifty-second fiscal year	.....	25.81	.....	25.81	.....	.....
Territorial institutions, fifty-second fiscal year	.....	13.35	.....	13.35	.....	.....
Provisional indebtedness sinking fund	33,476.41	493.19	7.15	.....	10,000.00	23,976.75
Insane asylum permanent fund	2,377.09	30.80	.....	.....	2,377.09	30.80
Capitol building bonds sinking fund	109,132.16	1,459.67	21.45	.....	.....	110,613.28
Territorial purposes, fifty-third fiscal year	.....	230.93	.....	230.93	.....	.....
Territorial institutions, fifty-third fiscal year	.....	134.64	.....	134.64	.....	.....
Blind asylum permanent fund	32.14	7,874.16	.....	2,500.00	.....	5,406.30
Geological survey	10,325.15	244.19	3.58	.....	.....	10,572.92
Exposition fund	12,514.70	3,819.97	5.72	16,191.07	.....	149.32
Capitol contingent bond sinking fund	2,058.48	13.77	.....	.....	2,058.88	13.37
Cattle indemnity fund	2,274.88	3,563.96	.....	.....	4,670.55	1,168.29
Territorial purposes, fifty-fourth fiscal year	5,012.18	10,798.26	343.95	10,504.29	5,650.00	.....
Territorial institutions, fifty-fourth fiscal year	.....	3,282.37	213.35	3,495.72	.....	.....
University of New Mexico income	.....	.....	.....	.....	.....	.....
Capitol maintenance fund, special	.....	.....	4,000.00	.....	233.74	3,766.26
Penitentiary permanent fund	449.04	2,826.96	.....	500.00	1,761.97	1,014.03

Quarterly statement of the Territorial treasurer of New Mexico, second quarter of the fifty-fourth fiscal year, etc.—Continued.

Title of fund or account.	Balances, Feb. 28, 1903.	Receipts during quarter.	Transfers to funds.	Transfers from funds.	Payments during quarter.	Balances, May 31, 1903.
United States land commission			$7,000.00		$212.97	$6,787.03
Normal university, Las Vegas, permanent		$6,066.60		$1,500.00		4,566.60
Normal school, Silver City, permanent	$1,200.00	6,066.60		2,500.00		4,766.60
Maintenance board of public lands		368.00	4,500.00	500.00	888.25	3,479.75
The Palace income fund		1,317.34				1,317.34
School of mines, permanent		1,386.60			1,386.60	
Reform school, permanent		10,581.00		3,500.00		7,081.00
Deaf and dumb asylum, permanent		2,646.60				2,646.60
Pullman tax		400.20		200.10	200.10	
Temporary provisional indebtedness fund			16,191.07	4,000.00	9,314.64	2,876.43
Territorial purposes, fifty-first fiscal year		1.29		1.29		
Total	359,833.23	81,606.57	56,812.50	56,812.50	158,922.00	282,517.80

RECAPITULATION.

Balances February 28, 1903	$359,833.23
Receipts during quarter	81,606.57
Total to be accounted for	441,439.80
Payments during quarter	158,922.00
Balance March 1, 1903	282,517.80

DISPOSITION OF FUNDS.

First National Bank of Santa Fe	$23,335.46
Bank of Commerce, Albuquerque	28,000.00
First National Bank of Las Vegas	30,000.00
First National Bank of Albuquerque	30,000.00
San Miguel National Bank, Las Vegas	30,000.00
First National Bank of Raton	15,000.00
First National Bank of Roswell	15,000.00
National Bank of Commerce of New York	11,582.25
Citizens' Bank, Roswell	15,000.00
First National Bank, Clayton	20,000.00
First National Bank, Carlsbad	20,000.00
Silver City National Bank	20,000.00
Taos County Bank, Taos	[a] 3,818.90
New Mexico Savings Bank and Trust Company, Albuquerque	[a] 781.19
Citizens' National Bank of Raton	20,000.00
Total	282,517.82

I certify the foregoing statement to be true and correct.

J. H. VAUGHN,
Territorial Treasurer.

SANTA FE, N. MEX., *June 1, 1903.*

[a] Funds not available.

Balances in hands of treasurer June 2, 1902, receipts, transfers, and disbursements, during the last half of fiscal year ending December 1, 1902, and first half of fiscal year 1903, and balances in treasurer's hands June 1, 1903.

	Balances June 2, 1902.	Receipts during year.	Transfers to fund.	Transfers from fund.	Payments during year.	Balances June 1, 1903.
Interest fund	$22,484.16	.....	$68,786.44	$5,000.00	$63,582.50	$22,688.10
School fund	.....	$725.00	.....	.....	.....	725.00
Interest on deposit	2,696.88	6,299.73	5,000.00	5,000.00	7,695.99	1,300.62
Interest and sinking fund, certificates of indebtedness	.....	27,590.79	14.30	5,956.82	17,997.00	3,651.27
University of New Mexico	1,262.74	.....	15,175.98	.....	15,889.40	549.32
University of New Mexico, deficiency fund	573.92	.....	6,898.15	.....	7,222.38	249.69
Agricultural college	3,284.93	.....	5,518.53	.....	8,647.23	156.23
Agricultural college, income fund	.....	134.57	.....	.....	101.38	33.19
Reform school, income fund	.....	355.87	.....	100.00	.....	255.87
Blind asylum, income fund	.....	412.90	.....	100.00	.....	312.90
New Mexico school of mines	2,039.12	.....	9,105.56	.....	10,815.09	329.59
School of mines, income fund	.....	538.10	.....	.....	312.83	225.27
Deaf and dumb asylum, income fund	.....	385.43	.....	.....	.....	385.43
Miners hospital, income fund	.....	387.69	.....	100.00	.....	287.69
New Mexico insane asylum	1,050.58	.....	27,592.59	.....	27,644.38	998.79
Insane asylum, income fund	.....	442.77	.....	.....	442.77	.....
Penitentiary, income fund	.....	385.09	.....	.....	376.45	8.64
Deaf and dumb asylum	72.80	.....	.....	.....	.....	72.80
Military institute, income fund	.....	356.13	.....	100.00	.....	256.13
New Mexico military institute	2,162.69	.....	9,657.42	.....	11,546.72	273.39
Water reservoir, permanent	.....	60.00	.....	.....	.....	60.00
Water reservoir, income fund	.....	615.57	.....	.....	615.57	.....
Compilation fund	658.10	348.50	.....	.....	955.60	51.00
Normal school, Silver City, income fund	.....	358.84	.....	100.00	.....	258.84
Normal school, New Mexico (Silver City)	463.75	.....	8,829.65	.....	8,467.35	826.05
Normal school, Las Vegas, income fund	.....	358.83	.....	.....	358.83	.....
Normal school, Las Vegas	525.28	.....	13,796.82	.....	13,822.21	499.39
Special purposes	883.63	9,708.75	3.58	.....	5,976.48	4,614.48
Compensation of assessors	2,025.99	17,488.05	4.51	.....	17,319.82	2,198.73
Springfield Fire and Marine Insurance Co	7,500.00	.....	.....	.....	7,500.00	.....
Pullman Co. tax fund	333.73	400.20	.....	200.10	533.83	.....
Legal expense fund	192.60	.....	.....	.....	.....	192.60
Special tax fund, fiftieth fiscal year	357.97	.....	.....	.....	350.00	7.97
Common school, income fund	7,690.13	20,845.34	500.00	500.00	24,142.84	4,392.63
Proceeds, 5 per cent U. S. land sales	4,715.95	2,026.26	.....	.....	.....	6,742.21
Charitable institutions	8,226.15	16,295.36	8.44	.....	15,567.95	3,962.00
Deficit fund	154.60	.....	.....	.....	.....	154.60
Sheep sanitary fund	1,114.46	2,851.54	.....	.....	3,774.13	191.87
Territorial institutions, fifty-first fiscal year	.....	146.48	.....	146.48	.....	.....
Penitentiary, current expense fund	1,524.39	.....	10,583.71	.....	10,478.42	1,579.68
Penitentiary, maintenance fund	816.65	.....	34,454.56	.....	34,108.15	663.06
Penitentiary, convict's earnings fund	819.35	15,584.22	.....	.....	15,984.94	418.63
Salary fund	20,568.22	10,400.58	37,551.80	.....	50,279.91	18,240.19
Supreme court fund	603.47	.....	334.38	.....	228.70	709.15
Miscellaneous fund	9,089.45	20.47	19,532.27	.....	15,966.40	12,675.79
Militia fund	486.00	.....	1,767.02	.....	1,394.73	858.29
Capitol, contingent expense fund	1,121.58	1,000.00	6,021.37	.....	7,914.90	228.05
Capitol, maintenance fund	.95	.....	.....	.95	.....	.....
United States annual appropriation, college of agriculture	.....	25,000.00	.....	.....	25,000.00	.....
Territorial purposes, fifty-second fiscal year	.....	1,783.92	.....	1,783.92	.....	.....
Territorial institutions, fifty-second fiscal year	.....	900.14	.....	900.14	.....	.....
Capitol building bonds, sinking fund	69,103.02	41,488.81	21.45	.....	.....	110,613.28
Provisional indebtedness, sinking fund	20,143.24	13,826.86	7.15	.....	10,000.00	23,976.75
Insane asylum, permanent fund	2,377.09	30.80	.....	.....	2,377.09	30.80
Penitentiary, permanent fund	1,430.96	2,826.96	.....	500.00	2,743.89	1,014.03
Territorial purposes, fifty-third fiscal year	.....	78,488.31	1,468.51	79,956.82	.....	.....
Blind asylum, permanent fund	32.14	7,874.16	.....	2,500.00	.....	5,406.30
Deaf and dumb asylum, permanent fund	12,686.71	2,646.60	.....	.....	12,686.71	2,646.60
Territorial institutions, fifty-third fiscal year	.....	42,707.91	859.21	43,567.12	.....	.....
Geological survey	3,740.99	6,828.35	3.58	.....	.....	10,572.92
Capitol contingent bond, sinking fund	2,244.48	3,222.77	.....	.....	5,453.88	13.37

Balances in hands of treasurer June 2, 1902, receipts, transfers, and disbursements, etc.—Continued.

	Balances June 2, 1902.	Receipts during year.	Transfers to fund.	Transfers from fund.	Payments during year.	Balances June 1, 1903.
Cattle indemnity fund	$1,514.26	$18,128.12			$18,474.09	$1,168.29
Territorial purposes, fifty-fourth fiscal year		99,173.95	$3,980.41	$91,698.86	11,455.50	
Territorial institutions, fifty-fourth fiscal year		52,769.61	2,359.11	55,128.72		
University of New Mexico, income		70.67			70.67	
Normal university, Las Vegas, permanent		7,266.60		1,500.00	1,200.00	4,566.60
Normal school, Silver City, permanent		7,266.60		2,500.00		4,766.60
United States Land Commisson			7,000.00		212.97	6,787.03
Louisiana Purchase Exposition fund	1,978.74	14,355.93	5.72	16,191.07		149.32
Capitol maintenance, special			4,000.00		233.74	3,766.26
Maintenance, board of public lands		368.00	4,500.00	500.00	888.25	3,479.75
The Palace income fund		1,317.34				1,317.34
School of mines, permanent		1,386.60			1,386.60	
Reform school, permanent		10,581.00		3,500.00		7,081.00
Temporary provisional indebtedness			16,191.07	4,000.00	9,314.64	2,876.43
Territorial purposes, fifty-first fiscal year		1.29		1.29		
Total	215,251.85	576,778.86	321,482.29	321,482.29	509,512.91	282,517.80

RECAPITULATION.

Balances June 2, 1902	$215,251.85
Receipts during year	576,778.86
Total to be accounted for	792,030.71
Payments during year	509,512.91
Balances June 1, 1903	282,517.80

DISPOSITION OF FUNDS.

First National Bank, Santa Fe	$23,335.46
Bank of Commerce, Albuquerque	28,000.00
First National Bank, Las Vegas	30,000.00
First National Bank, Albuquerque	30,000.00
San Miguel National Bank, Las Vegas	30,000.00
First National Bank, Raton	15,000.00
First National Bank, Roswell	15,000.00
National Bank of Commerce, New York	11,582.25
Citizens' National Bank, Roswell	15,000.00
First National Bank, Clayton	20,000.00
First National Bank, Carlsbad	20,000.00
Silver City National Bank	20,000.00
Taos County Bank, Taos, unavailable	3,818.90
New Mexico Savings Bank and Trust Company, Albuquerque, unavailable	781.19
Citizens' National Bank, Raton	20,000.00
Total	282,517.80

Banks in which Territorial funds are deposited.

Name of bank.	Amount applied for.	Amount of bond.	Interest paid on deposit for year.	Balance June 1, 1903.
First National Bank of Santa Fe				$23,335.46
Bank of Commerce, Albuquerque	$28,000.00	$56,000.00	$847.11	28,000.00
First National Bank of Las Vegas	30,000.00	60,000.00	909.42	30,000.00
First National Bank of Albuquerque	30,000.00	60,000.00	913.24	30,000.00
San Miguel National Bank, Las Vegas	30,000.00	60,000.00	890.00	30,000.00
First National Bank of Raton	15,000.00	30,000.00	454.53	15,000.00
First National Bank of Roswell	15,000.00	30,000.00	448.65	15,000.00
National Bank of Commerce of New York[a]				11,582.25
Citizens' National Bank of Roswell	15,000.00	30,000.00	448.84	15,000.00
First National Bank of Clayton	20,000.00	40,000.00	500.00	20,000.00
First National Bank of Carlsbad	20,000.00	40,000.00	597.29	20,000.00
Silver City National Bank	20,000.00	40,000.00	235.97	20,000.00
Taos County Bank of Taos (in hands of receiver)			24.68	3,818.90
New Mexico Savings Bank and Trust Co., Albuquerque (in hands of receiver)				781.19
Citizens' National Bank of Raton	20,000.00	40,000.00	30.00	20,000.00
Total	243,000.00	486,000.00	6,299.73	282,517.80

[a] To pay coupons.

Statement of the debt of the Territory of New Mexico.

Title of bond.	Law of issue.	Amount outstanding.	Date of bond.	Rate of interest.	When interest is payable.	Place of payment, principal and interest.	Time to run and option.	When due.	Provision for payment.
				Per cent.					
Capitol building bonds	Sec. 2527, C. L	$100,000.00 96,000.00	Sept. 1, 1884 Mar. 1, 1885	7 7	Mar. and Sept.	National Bank of Commerce, New York.	20 years	Sept. 1, 1904 Mar. 1, 1905	Annual tax from Sept. 1, 1899, sufficient to raise 20 per cent of issue for 5 years.
Current expense bonds	Chap. 44, laws of 1887, p. 86.	50,000.00 50,000.00 50,000.00	May 2, 1887 Nov. 1, 1887 May 1, 1888	6 6 6	May Nov May	First National Bank of New York.	20 years; optional at 5 or 10 years from date.	May 2, 1907 Nov. 1, 1907 May 1, 1908	
Provisional indebtedness bonds.	Chap. 122, laws of 1889, p. 295.	90,000.00 100,000.00	May 1, 1889 Sept. 2, 1889	6 6	Mar. and Sept.	National Bank of Commerce, New York.	30 years; optional at 20 years or after.	May 1, 1919 Sept. 2, 1919	Same provision as for capitol contingent.
Insane asylum bonds	Chap. 39, laws of 1891, p. 87.	25,000.00	Oct. 1, 1891	6	Jan. and July.	do	do	Oct. 1, 1921	Annual levy after 20 years sufficient to pay bonds in full at maturity.
Casual deficit bonds	Sec. 7, chap. 61, laws of 1893, p. 102.	101,800.00	May 1, 1893	5	do	do	30 years; optional after 10 years.	May 1, 1923	Annual tax after 10 years sufficient to pay bonds at maturity.
Refunding bonds	Sec. 7, chap. 61, laws of 1893, p. 104.	104,000.00	July 1, 1893	6	do	do	30 years; optional after 20 years.	July 1, 1923	Annual tax after 20 years sufficient to pay bonds at maturity.
Penitentiary refunding bonds.	Sec. 11, chap. 61, laws of 1893, p. 105.	71,000.00 10,000.00	July 1, 1894 Jan. 1, 1895	6 6	Mar. and Sept.	do	30 years; optional at 20 years or after.	July 1, 1924 Jan. 1, 1925	Same as for refunding bonds.
Territorial institutions bonds.	Sec. 1, chap. 44, laws of 1895.	35,000.00	July 1, 1895	5	Jan. and July.	do	30 years; optional at 10 years or after.	July 1, 1925	Annual tax after 10 years sufficient to pay the bonds at maturity.
New Mexico Military Institute bonds.	Sec. 1, chap. 42, laws of 1895.	15,000.00	do	5	do	Western National Bank, New York.	do	do	Do.
Insane asylum bonds	Sec. 1, chap. 43, laws of 1895.	30,000.00	do	5	do	National Bank of Commerce, New York.	30 years; optional at 20 years or after.	Jan. 1, 1925	Do.
Capitol rebuilding bonds.	Sec. 7, chap. 39, laws of 1895.	25,000.00 50,000.00	May 1, 1895 Nov. 1, 1895	5 5	May and Nov.	do	do	May 1, 1925 Nov. 1, 1925	Do.
Capitol rebuilding bonds, second series.	Sec. 1, chap. 9, laws of 1899.	60,000.00	May 1, 1899	4	do	do	30 years; optional after 20 years.	May 1, 1929	Same as capitol contingent fund bonds.
Certificates of indebtedness, series A.	Sec. 1, chap. 59, laws of 1899.	15,000.00	Mar. 1, 1899	6	Mar. and Sept.	Treasurer's office, Santa Fe, N. Mex.	5 years[b]		
Certificates of indebtedness, series B.	Sec. 1, chap. 49, laws of 1899.	20,500.00	do	6	do	do	do		
Total bonded indebtedness.		1,098,300.00							

These bonds are on their face payable at the First National Bank, New York, but all coupons are paid by the National Bank of Commerce in New York.

Certificate No. 47, Series B, included in call of 1901, for $100, not presented for payment	$100.00
Certificate No. 23, Series A, included in call of 1902, for $1,000, not presented for payment	1,000.00
Certificates Nos. 7, 11, 16, and 22, Series A, included in call of 1903, for $1,000 each, not presented for payment	4,000.00
Certificates Nos. 10, 15, 28, and 46, Series B, included in call of 1903, for $1,000 each, not presented for payment	4,000.00
Certificates Nos. 8 and 10, Series B, included in call of 1903, for $500 each, not presented for payment	1,000.00
Certificates Nos. 9, 11, 59, 61, and 62, Series B, included in call of 1903, for $100 each, not presented for payment	500.00
	10,600.00

Statement of the debt of the Territory of New Mexico—Continued.

SUMMARY OF TERRITORIAL DEBT.

Territorial bonded debt June 1, 1902, including certificates of indebtedness in the calls of 1901, 1902, and 1903, and not presented for payment, amounting to $10,600		$1,123,300.00
Paid during year:		
Provisional indebtedness, sinking fund	$10,000.00	
Certificates of indebtedness, Series A	6,000.00	
Certificates of indebtedness, Series B	9,000.00	
		25,000.00
Territorial bonded debt outstanding June 1, 1903		1,098,300.00
Sinking funds in hands of Territorial treasurer for redemption of bonded indebtedness on June 1, 1903, viz:		
Capitol building bond sinking fund	$110,613.28	
Provisional indebtedness sinking fund	23,976.75	
		134,590.03
Net Territorial debt June 1, 1903		963,709.97

List of fire insurance companies which have complied with chapter 49, laws of 1897.

Name of company.	Location.	Security.	Remarks.
German-American Insurance Co.	New York City	$10,000	Territory of New Mexico refunding bonds.
American Central Insurance Co.	St. Louis, Mo.	10,000	Certificate of deposit, First National Bank of Las Vegas, N. Mex.
Ætna Insurance Co	Hartford, Conn	10,000	Capitol rebuilding bonds.
Atlas Assurance Co	London, England	10,000	$1,000 provisional indebtedness bonds; $6,000 capitol deficit bonds; $3,000 refunding bonds.
British America Assurance Co.	Toronto, Canada	10,000	Capitol rebuilding bonds.
Continental Insurance Co	New York City	10,000	Provisional indebtedness bonds.
Fireman's Fund Insurance Co.	San Francisco, Cal	10,000	Certificate of deposit, First National Bank of Albuquerque, N. Mex.
Fire Association of Philadelphia.	Philadelphia, Pa	11,000	Real-estate mortgage.
Hartford Insurance Co	Hartford, Conn	10,000	Do.
Insurance Company of North America.	Philadelphia, Pa	10,000	$2,000 provisional indebtedness bonds of New Mexico; $8,000 Grant County funding bonds.
London and Lancashire Fire Insurance Co.	Liverpool, England	10,000	One bond United States consols fours for $10,000.
Liverpool, London, and Globe Insurance Co.	do	10,000	$5,000 refunding bonds, Territory of New Mexico; $5,000 refunding bonds Bernalillo County of New Mexico.
National Fire Insurance Co.	Hartford, Conn	10,000	City of Silver City (N. Mex.) gold refunding bonds.
North British and Mercantile Insurance Co.	London, Edinburgh, and Great Britain.	10,000	Territorial institution bonds.
Niagara Fire Insurance	New York City	10,000	Provisional indebtedness bonds.
Norwich-Union Fire Insurance Society.	Norwich, England	10,000	One bond United States consols fours for $5,000, and $5,000 capitol rebuilding bonds of New Mexico.
Northern Assurance Co	London, England	10,000	Certificate of deposit, First National Bank of Santa Fe, N. Mex.
Orient Insurance Co	Hartford, Conn	10,000	One bond United States consols fours for $10,000.
Palatine Insurance Co., Limited.	London, England	10,000	Do.
Royal Insurance Co	Liverpool, England	10,000	Refunding bonds, Territory of New Mexico.
St. Paul Fire and Marine Insurance Co.	St. Paul, Minn	10,000	Refunding bonds (gold) of Grant County, N. Mex.
Scottish Union and National Insurance Co.	Edinburgh, Scotland	10,000	Certificates of deposit: $5,000, San Miguel National Bank of Las Vegas, N. Mex.; $5,000, First National Bank of Albuquerque, N. Mex.
Springfield Fire and Marine Insurance Co.	Springfield, Mass	10,000	Refunding bonds, Valencia County, N. Mex.
Total		231,000	

Assessed valuations of the Territory for the years 1901 and 1902.

	1901.				1902.			
	Assessed valuation.	Arithmetical product.	Cash product.	Percentage collected.	Assessed valuation.	Arithmetical product.	Cash product.	Percentage collected.
Bernalillo	$4,017,850.00	$57,415.08	$38.651.00	67.3	$3,893,585.00	$54,471.25	$20,280.48	37.2
Chaves	2,596,299.00	37,101.13	33,623.87	90.6	2,789,377.00	39,023.38	18,370.99	47
Colfax	2,713,302.00	38,773.08	33,501.13	86.4	2,798,074.00	39,145.06	18,769.94	47.9
Doña Ana	1,985,470.00	28,372.36	19,948.12	70.3	2,063,326.00	28,865.93	11,886.13	41.2
Eddy	1,657,720.00	23,688.81	21,925.52	92.1	1,858,049.00	25,994.11	12,312.96	47.3
Grant	3,108,427.50	44,419.43	36,281.80	81.7	2,826,735.80	39,546.02	19,724.49	49.9
Guadalupe	975,831.00	13,944.63	6,831.05	48.9	1,187,882.40	16,618.48	5,812.41	34.9
Lincoln	1,164,759.00	16,644.41	14,362.04	86.3	1,162,340.00	16,261.14	7,377.11	45.4
Mora	941,622.00	13,455.78	10,043.60	74.6	960,015.00	13,430.60	4,658.37	34.7
Otero	1,038,307.14	14,837.41	13,309.84	89.7	1,199,429.51	16,780.01	7,838.93	46.7
Rio Arriba	791,669.00	11,312.94	6,161.82	54.4	834,681.00	11,677.19	4,344.21	37.2
San Juan	529,703.00	7,569.45	4,714.45	62.3	530,240.00	7,418.06	3,129.99	42.2
San Miguel	3,805,772.00	54,384.48	40,036.07	73.6	4,368,200.00	61,111.12	19,865.82	32.5
Santa Fe	1,808,071.00	25,837.33	17,684.97	68.4	2,037,390.00	28,503.09	10,364.64	36.3
Sierra	1,323,762.15	18,916.56	16,117.10	85.2	1,476,827.80	20,660.81	8,136.24	39.4
Socorro	1,922,450.00	27,471.81	17,987.80	65.4	1,959,740.00	27,416.77	7,388.90	27
Taos	412,658.00	5,896.88	5,704.41	96.7	591,746.00	8,278.53	3,490.09	42.1
Union	1,869,883.00	26,720.63	16,735.35	62.6	1,931,210.00	27,017.63	14,832.11	54.9
Valencia	1,850,000.50	26,436.50	10,253.23	38.8	1,811,110.61	25,337.43	6,837.01	27
McKinley	1,179,083.00	16,849.10	10,325.26	61.2	957,361.00	13,393.49	5,823.47	43.5
Luna	1,284,408.65	18,354.20	16,988.20	92.5	1,396,673.65	19,539.46	9,213.06	47.1
Totals	36,977,047.94	528,402.00	391,186.64	74	38,633,993.27	540,489.56	220,457.35	40.8
Tax levies.	14.29 mills.				13.99 mills.			

REPORT OF THE AUDITOR OF THE TERRITORY.

By W. G. SARGENT.

STATEMENT A.—*Payments, by counties, of Territorial tax for year ending June 1, 1903.*

County.	Fifty-third fiscal year.		Fifty-fourth fiscal year.		Total payments.
	Third quarter.	Fourth quarter.	First quarter.	Second quarter.	
Bernalillo	$15,914.87	$1,983.47	$20,396.02	$832.32	$38,576.68
Chaves	16,251.76	718.51	18,363.28	997.10	36,330.65
Colfax	13,802.51	1,581.32	18,042.36	1,119.32	34,545.51
Doña Ana	7,678.92	.....	12,982.08	1,546.15	22,207.15
Eddy	10,578.00	581.91	11,977.04	937.96	24,074.91
Grant	15,158.82	1,477.20	20,434.03	1,144.94	38,214.99
Guadalupe	2,226.00	153.92	6,067.93	422.82	8,890.67
Lincoln	6,981.02	1,901.73	7,609.17	560.13	17,052.05
Luna	8,191.95	58.10	9,600.37	96.09	17,946.51
Mora	4,253.55	75.60	4,772.28	163.48	9,264.91
McKinley	3,032.28	3,974.59	1,565.09	476.19	9,048.15
Otero	5,625.36	693.17	7,763.68	426.30	14,508.51
Rio Arriba	3,268.63	.....	5,016.62	118.32	8,403.57
San Juan	1,015.40	662.43	3,284.70	652.40	5,614.93
Santa Fe	7,043.84	1,706.61	9,467.00	882.98	19,099.93
San Miguel	18,114.57	471.60	19,570.37	892.71	39,049.25
Sierra	7,128.18	1,134.88	8,408.79	458.55	17,130.40
Socorro	7,904.24	286.14	7,193.85	1,064.01	16,448.24
Taos	2,210.32	536.09	3,229.20	261.11	6,236.72
Union	9,584.19	930.70	13,339.04	2,309.87	26,163.80
Valencia	3,202.44	564.73	6,736.82	310.54	10,814.53
Total	169,166.35	19,442.70	215,839.72	15,173.29	419,622.06

STATEMENT B.—*Receipts from sources other than taxation for year ending June 1, 1903.*

Source from which received.	Fifty-third fiscal year.		Fifty-fourth fiscal year.		Total receipts.
	Third quarter.	Fourth quarter.	First quarter.	Second quarter.	
Sale of compiled laws	$119.00	$76.50	$102.00	$51.00	$348.50
J. H. Vaughn, Territorial treasurer, interest on deposits	1,430.46	1,540.91	1,626.09	1,702.27	6,299.73
H. O. Bursum, superintendent of penitentiary, convict earnings	4,808.32	4,600.15	3,607.61	2,568.14	15,584.22
J. W. Raynolds, Territorial secretary, fees	2,158.00	3,071.75	3,608.75	5,168.00	14,006.50
A. A. Keen, commissioner public lands	2,722.17	12,910.59	8,917.03	46,500.71	71,050.50
Capitol maintenance board	.....	.....	.....	1,000.00	1,000.00
J. A. La Rue, secretary of cattle sanitary board	1,000.00	3,500.00	1,000.00	3,000.00	8,500.00
John S. Clark, coal-oil inspector, school fund	725.00	.....	.....	.....	725.00
Sol. Spiegelberg, treasurer of historical society	20.47	.....	.....	.....	20.47
W. G. Sargent, auditor	.....	20.00	.....	.....	20.00
Pullman Car Co	.....	.....	.....	400.20	400.20
R. J. Palen, treasurer of Louisiana Purchase Exposition	.....	.....	.....	3,427.55	3,427.55
Clerks of district courts	3,122.55	2,164.30	2,871.87	2,241.86	10,400.58
C. V. Safford, chief clerk house of representatives, thirty-fifth legislature	.....	.....	.....	.....	5.55
Total	16,105.97	27,884.20	21,733.35	66,065.28	131,788.80

RECAPITULATION.

From counties, tax levy	$169,166.35	$19,442.70	$215,839.72	$15,173.29	$419,622.06
Sources other than taxation	16,105.97	27,884.20	21,733.35	66,065.28	131,788.80
Total	185,272.32	47,326.90	237,573.07	81,238.57	551,410.86

STATEMENT C.—*Quarterly statement, covering the third quarter of the fifty-third fiscal year, commencing June 1, 1902, and ending August 31, 1902.*

Fund or account.	Balances June 1, 1902.	Receipts during quarter.	Transfers to funds.	Transfers from funds.	Warrants drawn.	Balances Aug. 31, 1902.
Capitol maintenance, special	$1.00					$1.00
Capitol contingent expense	1,121.58		$2,693.51		$1,511.70	2,303.39
Capitol contingent bond sinking	32,244.88	$2,805.31				35,050.19
Cattle indemnity fund	11,313.58	3,726.16				15,039.74
Compensation of assessors	1,852.83	7,053.70			6,190.72	2,715.81
Special tax, fiftieth fiscal year	377.97					377.97
Agricultural college	3,284.93		2,216.22		3,284.93	2,216.22
Sheep sanitary fund	2,618.99	1,048.66				3,667.65
University of New Mexico deficiencies	573.92		2,770.28		2,597.23	746.97
University of New Mexico	1,262.74		6,094.61		5,714.03	1,643.32
Deaf and dumb asylum	72.80					72.80
School of mines	2,039.12		3,656.77		5,389.72	806.17
Normal school (Silver City)	463.75		3,545.95		2,276.12	1,733.58
Normal school (Las Vegas)	525.28		5,540.56		4,571.91	1,493.93
Military institute	2,162.69		3,878.39		4,995.33	1,045.75
Insane asylum	1,050.58		11,081.11		9,143.84	2,987.85
Insane asylum, permanent	2,377.09					2,377.09
Interest fund	56,443.77		30,065.20			86,508.97
Militia fund			790.54	$790.54		
Supreme court fund			149.60	149.60		
Penitentiary current expense	1,524.39		4,041.96		2,654.97	2,911.38
School fund		725.00				725.00
Penitentiary maintenance	306.65		11,801.04		8,488.46	3,119.23
Convicts' earnings	721.13	4,808.32			4,793.93	735.52
Salary fund	18,026.13	3,122.55	16,800.71	1,045.75	11,588.05	25,315.59
Miscellaneous fund			8,738.60	8,738.60		
Compilation fund	658.10	119.00				777.10
5 per cent proceeds United States land sales	4,715.95					4,715.95
Common school income	7,336.38				3,571.89	3,764.49
Interest and sinking fund certificates of indebtedness	26,030.55	11,089.76		5,956.82		31,163.49
Interest on deposits	2,696.18	1,430.46				4,126.64
Deficiency fund	154.60					154.60
Pullman tax fund	333.73					333.73
Charitable institutions, fifty-second fiscal year		61.09				61.09
Provisional indebtedness, bond sinking	20,143.24	5,534.35				25,677.59
Territorial institutions:						
Fifty-first fiscal year		74.57		74.57		
Fifty-second fiscal year		273.02		273.02		
Territorial purposes, fifty-second fiscal year		528.06		528.06		
Special purposes:						
Fifty-first fiscal year	9.97	8.97				18.94
Fifty-second fiscal year	204.29	32.81				237.10
Legal expense	192.60					192.60
Printing laws and journals	831.62		564.98	900.00		496.60
Translating laws and journals	554.43		376.66			931.09
Supreme Court Reports, vol. 10			900.00		900.00	
Penitentiary board	881.88		763.27		425.05	1,220.10
Equalization board	419.05		282.48			701.53
Sisters' hospital, Albuquerque	448.25		329.25		448.25	329.25
St. Vincent's Hospital, Santa Fe	285.02		1,317.01		1,249.36	352.67
Orphans' school, Santa Fe	410.15		1,975.47		1,856.65	528.97
Grant County hospital	620.60		658.50		515.56	763.54
Sisters of Mercy Hospital	349.40		658.50		169.70	838.20
Ladies' hospital, Deming	243.78		439.01		231.55	451.24
Eddy County hospital	160.95		548.76		171.00	538.71
Ladies' Relief Society, Las Vegas	118.40		548.76		520.21	146.95
Children's Home, Albuquerque	554.72					554.72
Publication roster New Mexico Volunteers	339.62		225.86			565.48
Rent of armories	93.93		376.45		204.94	265.44
Support National Guard	52.45		188.23		138.55	102.13
Printing briefs	597.75		74.79			672.54
Printing docket and calendars	5.72		74.81			80.53
Supreme court legal expense	291.65		282.50			574.15
Auditor's contingent expense	15.26		263.66		96.45	182.47
Treasurer's contingent expense	249.50		376.66		306.10	320.06
Library, purchase of books	1,481.53		452.00		755.10	1,178.43
Library, contingent expense	404.19		113.00		58.78	458.41

STATEMENT C.—*Quarterly statement, covering the third quarter of the fifty-third fiscal year, commencing June 1, 1902, and ending August 31, 1902*—Continued.

Fund or account.	Balances June 1, 1902.	Receipts during quarter.	Transfers to funds.	Transfers from funds.	Warrants drawn.	Balances Aug. 31, 1902.
Supreme court reports:						
Vol. 1	$166.33		$113.00			$279.33
Vol. 11	922.81					922.81
Vol. 2	166.31		113.00			279.31
Governor's contingent expense	1,702.47		1,130.00			2,832.47
Historical society:						
Purchase of relics	58.97	$14.56	94.22			167.75
Contingent expense	117.93	5.91	188.33			312.17
Bureau of immigration, contingent expense	728.43		1,130.00		$105.74	1,752.69
Weather bureau	734.95		268.66		102.00	896.61
Solicitor-general, contingent expense	55.65		113.00		100.00	68.65
Printing tax books	12.29		452.00		288.48	175.81
Superintendent public instruction:						
Rent	5.33					5.33
Contingent expense	58.86		188.32			247.18
Transportation of convicts	393.74		1,883.27		1,236.49	1,040.52
Printing poll books	665.32		452.00		744.91	372.41
Furnishing normal school, Silver City	107.00					107.00
Reimbursing public land board			1,555.27			1,555.27
Furnishing normal school, Las Vegas			1,555.28		1,155.28	400.00
Money's Digest, South Carolina Reports	46.48		188.34		179.78	55.04
Agricultural college, income		12.69				12.69
Normal school:						
Silver City, income		262.71				262.71
Las Vegas, income		262.70				262.70
School of mines, income		312.83			312.83	
Military institute, income		262.70				262.70
Reform school, income		262.74				262.74
Blind asylum, income		278.42				278.42
Deaf and dumb asylum, income		278.50				278.50
Miners' hospital, income		262.76				262.76
Insane asylum, income		267.86				267.86
Penitentiary, income		263.26				263.26
Territorial purposes, fifty-third fiscal year		68,096.28	528.06	$68,624.34		
Territorial institutions, fifty-third fiscal year		38,436.30	347.59	38,783.89		
Charitable institutions, fifty-third fiscal year		6,475.26		6,475.26		
Penitentiary, permanent	1,430.96				85.27	1,345.69
Blind asylum, permanent	32.14					32.14
Special purposes, fifty-third fiscal year	551.18	3,284.70		3,110.55		725.33
Geological survey	3,740.99	2,749.99				6,490.98
Deaf and dumb asylum, permanent	12,686.71				12,686.71	
Exposition fund	5,978.74	4,391.33				10,370.07
Capitol building bond	73,103.02	16,654.03				89,757.05
Total	315,717.85	185,272.32	135,451.00	135,451.00	101,817.57	399,172.60

RECAPITULATION.

Balance June 1, 1902	$315,717.85
Receipts during quarter	185,272.32
	500,990.17
Warrants drawn during quarter	101,817.57
Balances August 31, 1902	399,172.60

NOTE.—Payments of interest coupons, maturing bonded indebtedness, certificates of indebtedness, cattle indemnity and sheep sanitary funds, and exposition fund are made direct by treasurer, and no warrants against these funds are drawn by auditor, but payments made from such accounts are only charged against same in the office of the auditor at the time of the annual burning of warrants, the last occurring November 16, 1901.

I certify the above statement to be true and correct.

W. G. SARGENT,
Territorial Auditor.

SANTA FE, N. MEX., *September 1, 1902.*

STATEMENT D.—*Quarterly statement, covering the fourth quarter of the fifty-third fiscal year, commencing September 1, 1902, and ending November 30, 1902.*

Fund or account.	Balances Sept. 1, 1902.	Receipts during quarter.	Transfers to funds.	Transfers from funds.	Warrants drawn.	Payments direct by treasurer.	Balances Dec. 1, 1902.
Capitol maintenance fund	$1.00						$1.00
Capitol, contingent:							
Expenses	2,303.39		$302.39		$2,605.78		
Bonds, sinking	35,050.19	$235.51				$30,000.00	5,285.70
Cattle indemnity fund	15,039.74	3,761.62				17,144.65	1,656.71
Compensation of assessors	2,715.81	814.61			1,412.85		2,117.57
Special tax, fiftieth fiscal year	377.97						377.97
Agricultural college	2,216.22		152.09		2,263.68		104.63
Sheep sanitary fund	3,667.65	125.34				3,212.23	580.76
University of New Mexico, deficiencies	746.97		190.11		746.97		190.11
University of New Mexico	1,643.32		418.29		1,643.32		418.29
Deaf and dumb asylum	72.80						72.80
School of mines	306.17		250.94				557.11
Normal school (Silver City)	1,733.58		243.34		834.30		1,142.62
Normal school (Las Vegas)	1,493.93		380.22				1,874.15
Military institute	1,045.75		266.15		1,128.79		183.11
Insane asylum	2,987.85		760.45		2,987.85		760.45
Insane asylum, permanent	2,377.09						2,377.09
Interest fund	86,508.97		2,706.74			65,039.61	24,176.10
Militia fund			88.76	$88.76			
Supreme court fund			16.79	16.79			
Penitentiary, current expenses	2,911.38		453.80		3,365.18		
School fund	725.00						725.00
Penitentiary, maintenance	3,119.23		1,268.79		4,388.02		
Convict earnings	735.52	4,600.15			4,982.97		352.70
Salary fund	25,315.59	2,164.30	1,886.23	115.90	11,462.45		17,787.77
Miscellaneous fund			981.09	981.09			
Compilation fund	777.10	76.50					853.60
5 per cent proceeds United States land sales	4,715.95						4,715.95
Common school income	3,764.49	11,308.49			1,360.66		13,712.32
Interest and sinking fund certificates of indebtedness	31,163.49	1,293.56				28,347.00	4,110.05
Interest on deposits	4,126.64	1,540.91					5,667.55
Deficiency fund	154.60						154.60
Pullman tax fund	333.73					333.73	
Charitable institutions, fifty-second fiscal year	61.09	89.96					151.05
Provisional indebtedness bond, sinking	25,677.59	644.15					26,321.74
Territorial institutions:							
Fifty-first fiscal year		21.66		21.66			
Fifty-second fiscal year		489.96		489.96			
Territorial purposes, fifty-second fiscal year		940.45		940.45			
Special purposes:							
Fifty-first fiscal year	18.94	2.83		21.17			.60
Fifty-second fiscal year	237.10	63.54		300.64			
Legal expense	192.60						192.60
Printing laws and journals	496.60		63.50				560.10
Translating laws and journals	931.09		42.34				973.43
Penitentiary board	1,220.10		84.34		866.60		437.84
Equalization board	701.53		31.56		376.90		356.19
Sisters' hospital, Albuquerque	329.25				329.25		
St. Vincent's Hospital, Santa Fe	352.67				352.67		
Orphans' school, Santa Fe	528.97				528.97		
Grant County Hospital	763.04				290.75		472.79
Sisters of Mercy Hospital	838.20				317.10		521.10
Ladies' hospital, Deming	451.24				304.47		146.77
Eddy County Hospital	538.71				220.43		318.28
Ladies' Relief Society, Las Vegas	146.95				146.95		
Children's Home, Albuquerque	554.72						554.72
Publication roster New Mexico Volunteers	565.48		25.28				590.76
Rent of armories	265.44		42.32		201.51		106.25
Support of National Guard	102.13		21.16		59.72		63.57
Printing briefs	672.54		8.39		56.25		624.68
Printing dockets and calendars	80.53		8.40		21.25		67.68
Supreme court legal expenses	574.15		31.74				605.89
Auditor's contingent expenses	182.47		29.64		51.24		160.87

STATEMENT D.—*Quarterly statement, covering the fourth quarter of the fifty-third fiscal year, commencing September 1, 1902, and ending November 30, 1902*—Continued.

Fund or account.	Balances Sept. 1, 1902.	Receipts during quarter.	Transfers to funds.	Transfers from funds.	Warrants drawn.	Payments direct by treasurer.	Balances Dec. 1, 1902.
Treasurer's contingent expenses	$320.06	.....	$42.34	.....	$97.76	.....	$264.64
Library:							
Purchase of books	1,178.43	.....	50.79	.....	15.00	.....	1,214.22
Contingent expenses	458.41	.....	12.70	.....	50.00	.....	421.11
Supreme Court Reports:							
Vol. 1	279.33	.....	12.69	.....	.....	.....	292.02
Vol. 11	922.81	.....	.....	.....	.....	.....	922.81
Vol. 2	279.31	.....	12.69	.....	.....	.....	292.00
Governor's contingent expenses	2,832.47	.....	127.08	.....	.....	.....	2,959.55
Historical Society:							
Purchase of relics	167.75	.....	10.38	.....	177.46	.....	.67
Contingent expenses	812.17	.....	21.17	.....	331.61	.....	1.73
Bureau of immigration, contingent expenses	1,752.69	.....	127.08	.....	1,809.14	.....	70.63
Weather Bureau	896.61	.....	29.64	.....	167.00	.....	759.25
Solicitor-general, contingent expenses	68.65	.....	12.70	.....	75.00	.....	6.35
Printing tax books	175.81	.....	50.79	.....	.....	.....	226.60
Superintendent of public instruction:							
Rent	5.33	.....	.....	.....	.....	.....	5.33
Contingent expenses	247.18	.....	21.17	.....	262.25	.....	6.10
Transportation of convicts	1,040.52	.....	210.70	.....	1,251.22	.....	.....
Printing poll books	372.41	.....	50.79	.....	52.73	.....	370.47
Furnishing normal school, Silver City	107.00	.....	.....	$11.06	.....	.....	95.94
Reimbursing public land board	1,555.27	.....	790.00	154.24	2,191.03	.....	.....
Furnishing normal school, Las Vegas	400.00	.....	756.76	154.23	.....	.....	1,002.53
Money's Digest, Supreme Court Reports	55.04	.....	21.16	.....	.....	.....	76.20
Agricultural college, income	12.69	$60.47	.....	.....	.....	.....	73.16
Normal school:							
Silver City, income	262.71	75.30	.....	.....	.....	.....	338.01
Las Vegas, income	262.70	75.30	.....	.....	.....	.....	338.00
School of mines, income	.....	75.63	.....	.....	.....	.....	75.63
Military institute, income	262.70	74.18	.....	.....	.....	.....	336.88
Reform school, income	262.74	74.10	.....	.....	.....	.....	336.84
Blind asylum, income	278.42	115.35	.....	.....	.....	.....	393.77
Deaf and dumb asylum, income	273.50	72.50	.....	.....	.....	.....	346.00
Miners' hospital, income	262.76	73.90	.....	.....	.....	.....	336.66
Insane asylum, income	267.86	90.66	.....	.....	.....	.....	358.52
Penitentiary, income	263.26	88.47	.....	.....	290.83	.....	60.90
Territorial purposes, fifty-third fiscal year	.....	6,764.14	940.45	7,704.59	.....	.....	.....
Territorial institutions, fifty-third fiscal year	.....	2,149.97	511.62	2,661.59	.....	.....	.....
Charitable institutions, fifty-third fiscal year	.....	362.59	.....	.....	.....	.....	362.59
Penitentiary, permanent	1,345.69	.....	.....	.....	533.65	.....	812.04
Blind asylum, permanent	32.14	.....	.....	.....	.....	.....	32.14
Special purposes, fifty-third fiscal year	725.33	182.63	308.47	1,213.89	.....	.....	2.54
Geological survey	6,490.98	282.96	.....	.....	.....	.....	6,773.94
Exposition fund	10,370.07	450.34	.....	.....	.....	$4,000.00	6,820.41
Capitol building bonds, sinking fund	89,757.05	2,003.74	.....	.....	.....	4,000.00	87,760.79
Water reservoir:							
Income	.....	615.57	.....	.....	615.57	.....	.....
Permanent	.....	60.00	.....	.....	.....	.....	60.00
University of New Mexico, income	.....	70.67	.....	.....	.....	.....	70.67
Territorial purposes, fifty-fourth fiscal year	.....	3,094.68	.....	.....	.....	.....	3,094.68
Territorial institutions, fifty-fourth fiscal year	.....	1,805.94	.....	.....	.....	.....	1,805.94
Special purposes, fifty-fourth fiscal year	.....	128.97	.....	.....	.....	.....	128.97
Charitable institutions, fifty-fourth fiscal year	.....	305.30	.....	.....	.....	.....	305.30
Total	399,172.60	47,326.90	14,876.02	14,876.02	51,227.13	152,077.22	243,195.15

RECAPITULATION.

Balances September 1, 1902		$399,172.60
Receipts during quarter		47,326.90
		446,499.50
Warrants drawn during quarter	$51,227.18	
Payments direct by treasurer include interest coupons, maturing bonded indebtedness, cattle indemnity and sheep sanitary funds, Pullman tax, and St. Louis Exposition fund, for which auditor draws no warrants and against which funds no charge is made in the office of the auditor until the annual burning of warrants, the last occurring November 16, 1902, at which time treasurer presented for credit canceled coupons and bonds, and other evidences of payments from above-mentioned funds to amount of	152,077.22	
		203,304.35
Balances December 1, 1902		243,195.15

I certify the above statement to be true and correct.

W. G. SARGENT, *Territorial Auditor.*

STATEMENT E.—*Quarterly statement covering the first quarter of the fifty-fourth fiscal year, commencing December 1, 1902, and ending February 28, 1903.*

Title of fund or account.	Balances Dec. 1, 1902.	Receipts during quarter.	Transfers to funds.	Transfers from funds.	Warrants drawn.	Balances Feb. 28, 1903.
Capitol maintenance, special	$1.00			$0.95		$0.05
Capitol, contingent expense			$2,613.36		$1,960.27	653.09
Capitol, contingent bond-sinking fund	5,285.70	$168.18			3,395.00	2,058.88
Cattle indemnity fund	1,656.71	7,076.38				8,733.09
Compensation of assessors	2,117.57	8,987.36			7,719.44	3,385.49
Special tax, fiftieth fiscal year	377.97					377.97
Agricultural college	104.63		2,950.46			3,055.09
Sheep sanitary fund	580.76	1,446.68				2,027.44
University of New Mexico, deficiencies	190.11		3,688.07		3,260.41	617.77
University of New Mexico	418.29		8,113.76		7,172.97	1,359.08
Deaf and dumb asylum	72.80					72.80
School of mines	557.11		4,868.26		4,609.91	815.46
Normal school, Silver City	1,142.62		4,720.75		3,834.75	2,028.62
Normal school, Las Vegas	1,874.15		7,376.15		5,928.05	3,322.25
Military institute	183.11		5,163.31		4,481.14	865.28
Insane asylum	760.45		14,752.24		8,868.24	6,644.45
Insane asylum, permanent	2,377.09					2,377.09
Interest fund	24,176.10		32,925.83			56,501.93
Militia fund			766.75	559.39		207.36
Supreme court fund			145.10	105.86		39.24
Penitentiary, current expense			5,419.52		2,671.63	2,747.89
School fund	725.00					725.00
Penitentiary, maintenance			15,155.64		12,902.83	2,252.81
Convicts' earnings	352.70	3,607.61			3,648.99	311.32
Salary fund	17,787.77	2,871.87	16,293.79	986.87	9,337.45	26,629.11
Miscellaneous			8,475.53	6,183.41		2,292.12
Compilation fund	853.60	102.00			5,000.00	455.60
5 per cent proceeds United States land sales	4,715.95					4,715.95
Common school income	13,712.32	6,030.84				19,743.16
Certificates of indebtedness	4,110.05	14,224.32				18,334.37
Deficiency fund	154.60					154.60
Interest on deposits	5,667.55	1,626.09			5,824.00	1,469.64
Pullman-tax fund						
Charitable institutions, fifty-second fiscal year	151.05	5.57		156.62		
Provisional indebtedness bond, sinking	26,321.74	7,154.67				33,476.41
Territorial institutions:						
Fifty-first fiscal year		34.95		34.95		
Fifty-second fiscal year		123.81		123.81		
Territorial purposes, fifty-second fiscal year		239.60		239.60		
Special purposes:						
Fifty-first fiscal year	.60			.60		
Fifty-second fiscal year		3.60		3.60		
Legal expenses	192.60					192.60
Printing laws and journals	560.10					560.10
Translating laws and journals	973.43					973.43

STATEMENT E.—*Quarterly statement covering the first quarter of the fifty-fourth fiscal year, commencing December 1, 1902, and ending February 28, 1903*—Continued.

Title of fund or account.	Balances Dec. 1, 1902.	Receipts during quarter.	Transfers to funds.	Transfers from funds.	Warrants drawn.	Balances Feb. 28, 1903.
Penitentiary board	$437.84		$717.00			$1,154.84
Equalization board	356.19		269.87		$363.00	263.06
Sisters' hospital, Albuquerque			270.22		370.22	
St. Vincent's Hospital, Santa Fe			1,080.86		1,080.86	
Orphans' school, Santa Fe			1,621.30		1,621.30	
Grant County hospital	472.79		540.43		89.25	923.97
Sisters of Mercy hospital	521.10		540.43		381.08	680.45
Ladies' hospital, Deming	146.77		360.29		145.25	361.81
Eddy County hospital	318.28		450.37		279.13	489.52
Ladies' Relief Society, Las Vegas			450.37		450.00	.37
Children's home, Albuquerque	554.72					554.72
Publication roster, New Mexico volunteers	590.76		159.82			750.58
Rent of armories	106.25		266.38		192.20	180.43
Support of National Guard	63.57		133.19		9.97	186.79
Printing briefs	624.68		52.93		48.20	629.41
Printing dockets and calendars	67.68		52.93		93.00	27.61
Supreme court, legal expenses	605.89		250.85			856.74
Auditor's contingent expenses	160.87		234.12		212.45	182.54
Treasurer's contingent expenses	264.64		334.46		374.12	224.98
Library:						
Purchase of books	1,214.22		401.35		492.68	1,122.89
Contingent expenses	421.11		100.34		1.45	520.00
Supreme court reports:						
Vol. 1	292.02		7.98			300.00
Vol. 11	922.81					922.81
Vol. 2	292.00		8.00			300.00
Governor's contingent expenses	2,959.55		1,003.39			3,962.94
Historical society:						
Purchase of relics	.67		83.62			84.29
Contingent expenses	1.73		167.23			168.96
Bureau of immigration, contingent expenses	70.63		1,003.39		68.42	1,005.60
Weather bureau	759.25		234.12		56.50	936.87
Solicitor-general, contingent expenses	6.35		100.34			106.69
Printing tax books	226.60		401.35			627.95
Superintendent public instruction:						
Rent	5.33					5.33
Contingent expenses	6.10		167.23			173.33
Transportation of convicts			1,672.35		1,653.81	18.54
Printing poll books	370.47				25.50	344.97
Furnishing normal school, Silver City	95.94					95.94
Reimbursing public land board			1,850.36			1,850.36
Furnishing normal school, Las Vegas	1,002.58		1,254.29		1,828.76	428.18
Money's Digest, supreme court reports	76.20		13.29		76.20	13.29
Agricultural college, income	73.16	$61.41				134.57
Normal school:						
Silver City, income	338.01	20.83				358.84
Las Vegas, income	338.00	20.83			358.83	
School of mines, income	75.63	149.64				225.27
Military institute, income	336.88	19.25				356.13
Reform school, income	336.84	19.03				355.87
Blind asylum, income	393.77	19.13				412.90
Miners' hospital, income	336.66	19.03				355.69
Insane asylum, income	358.52	84.25				442.77
Penitentiary, income	60.90	33.36				94.26
Territorial purposes, fifty-third fiscal year		3,396.96		$3,396.96		
Territorial institutions, fifty-third fiscal year		1,987.00		1,987.00		
Charitable institutions, fifty-third fiscal year	362.59	144.24		506.83		
Penitentiary, permanent	812.04				666.09	145.95
Blind asylum, permanent	32.14					32.14
Special purposes, fifty-third fiscal year	2.54	187.75	4.20	129.07		65.42

STATEMENT E.—*Quarterly statement covering the first quarter of the fifty-fourth fiscal year, commencing December 1, 1902, and ending February 28, 1903*—Continued.

Title of fund or account.	Balances Dec. 1, 1902.	Receipts during quarter.	Transfers to funds.	Transfers from funds.	Warrants drawn.	Balances Feb. 28, 1903.
Geological survey	$6,773.94	$3,551.21				$10,325.15
Exposition fund	6,820.41	5,694.29				11,514.70
Capitol building, bond sinking fund	87,760.79	21,871.37				109,132.16
Water reservoir, income						
Water reservoir, permanent	60.00					60.00
University of New Mexico, income	70.67				$70.67	
Territorial purposes, fifty-fourth fiscal year	3,094.68	85,281.01	$3,636.56	$81,194.57	8,155.50	2,662.18
Territorial institutions, fifty-fourth fiscal year	1,805.94	47,681.30	2,145.76	51,633.00		
Special purposes, fifty-fourth fiscal year	128.97	3,418.67		2,975.70		571.94
Charitable institutions, fifty-fourth fiscal year	305.30	8,269.55	663.45	5,314.27		3,924.03
Deaf and dumb asylum, income	346.00	39.43				385.43
Normal university:						
Las Vegas, permanent		1,200.00			1,200.00	
Silver City, permanent		1,200.00				1,200.00
Total	243,195.15	237,573.07	155,533.06	155,533.06	106,379.52	374,388.70

RECAPITULATION.

Balances Dec. 1, 1902	$243,195.15
Receipts during quarter	237,573.07
	480,768.22
Warrants drawn during quarter	106,379.52
Balances Feb. 28, 1903	374,388.70

NOTE.—Payments of interest coupons, maturing bonded indebtedness, certificates of indebtedness, cattle indemnity and sheep sanitary funds, and exposition funds are made direct by treasurer and no warrants against these funds are drawn by auditor, and payments made from such funds are only charged against same in the office of the auditor at the time of the annual burning of warrants, the last occurring November 16, 1902.

I certify the above statement to be true and correct.

W. G. SARGENT,
Territorial Auditor.

SANTA FE, N. MEX., *March 1, 1903.*

STATEMENT F.—*Quarterly statement, covering the second quarter of the fifty-fourth fiscal year, commencing March 1, 1903, and ending May 31, 1903.*

Title of fund or account.	Balances Mar. 1, 1903.	Receipts during quarter.	Transfers to funds.	Transfers from funds.	Warrants drawn.	Balances May 31, 1903.
Capitol contingent expense	$658.09	$1,000.00	$412.11		$1,936.53	$128.67
Capitol contingent bond, sinking fund	2,058.88	13.77			2,058.88	13.77
Cattle indemnity fund	8,733.09	3,563.96				12,297.05
Compensation of assessors	3,385.49	632.38	4.51		1,899.39	2,122.99
Special tax, fiftieth fiscal year	377.97				350.00	27.97
Agricultural college	3,055.09		199.76		3,098.62	156.23
Sheep sanitary fund	2,027.44	230.86				2,258.30
University of New Mexico, deficiencies	617.77		249.69		617.77	249.69
University of New Mexico	1,359.08		549.32		1,359.08	549.32
Deaf and dumb asylum	72.80					72.80
School of mines	815.46		329.59		815.46	329.59
Normal school (Silver City)	2,028.62		319.61		1,522.18	826.05
Normal school (Las Vegas)	3,322.25		499.39		3,322.25	499.39
Military institute	865.28		349.57		941.46	273.39
Insane asylum	6,644.45		998.79		6,644.45	998.79
Insane asylum, permanent	2,377.09				2,377.09	
Interest fund	56,501.93		3,688.67	$5,000.00		55,190.60
Militia fund	207.36		120.97	328.33		
Supreme court fund	39.24		22.89	57.10		5.03
Penitentiary current expense	2,747.89		618.43		1,786.64	1,579.68

STATEMENT F.—*Quarterly statement, covering the second quarter of the fifty-fourth fiscal year, commencing March 1, 1903, and ending May 31, 1903*—Continued.

Title of fund or account.	Balances Mar. 1, 1903.	Receipts during quarter.	Transfers to funds.	Transfers from funds.	Warrants drawn.	Balances May 31, 1903.
School fund	$725.00					$725.00
Penitentiary maintenance	2,252.81		$6,729.09		$3,368.49	613.41
Convict earnings	311.32	$2,568.14			2,462.29	417.17
Salary fund	26,629.11	2,241.86	5,570.57	$123.58	14,161.55	17,156.41
Miscellaneous	2,229.12		1,337.05	3,335.09		294.08
Compilation fund	455.60	51.00			455.60	51.00
5 per cent proceeds United States land sales	4,715.95	2,026.26				6,742.21
Common school income	19,743.16	3,506.01	500.00	500.00	20,390.94	2,858.23
Interest on deposits	1,469.64	1,702.27	5,000.00	5,000.00	2,021.39	1,150.52
Deficiency fund	154.60					154.60
Pullman tax fund		400.20		200.10		200.10
Territorial institutions:						
Fifty-first fiscal year		15.30		15.30		
Fifty-second fiscal year		13.35		13.35		
Territorial purposes:						
Fifty-first fiscal year		1.29		1.29		
Fifty-second fiscal year		25.81		25.81		
Legal expense	192.60					192.60
Special purposes, fifty-second fiscal year		.40		.40		
Printing laws and journals	560.10				499.94	60.16
Translating laws and journals	973.43				500.00	473.43
Penitentiary board	1,154.84		89.88		332.40	912.32
Equalization board	263.06		33.70			296.76
Sisters' Hospital, Albuquerque			177.29			177.29
St. Vincent's Hospital, Santa Fe			709.17		709.17	
Orphans' school, Santa Fe			1,063.76		1,063.76	
Grant County Hospital	923.97		354.59			1,278.56
Sisters of Mercy Hospital	680.45		354.59		481.00	554.04
Ladies' Hospital, Deming	361.81		236.39		357.44	240.76
Eddy County Hospital	489.52		295.49		83.27	701.74
Ladies' Relief Society, Las Vegas	.37		295.49			295.86
Children's home, Albuquerque	554.72					554.72
Publication roster New Mexico Volunteers	750.58		93.80		113.02	731.36
Rent of armories	180.43		156.37		213.02	123.78
Support of National Guard	186.79		78.16		261.80	3.15
Printing briefs	629.41		28.55			657.96
Printing dockets and calendars	27.61		28.55		10.00	46.16
Capitol maintenance, special	.05		4,000.00		254.49	3,745.56
United States land commission			7,000.00		212.97	6,784.03
Special purposes, fifty-first fiscal year		.19		.19		
Supreme court, legal expense	856.74		135.94			992.68
Auditor's contingent expense	182.54		126.87		294.91	14.50
Library—						
Purchase of books	1,122.89		217.50		237.95	1,102.44
Payment of freight	520.00		54.37		105.00	469.37
Supreme Court Reports, vol. 1	300.00					300.00
New Mexico Reports, vol. 11	922.81					922.81
Supreme Court Reports, vol. 2	300.00					300.00
Historical Society:						
Purchase of relics	84.29		45.36			129.65
Contingent expenses	168.96		90.63			259.59
Bureau of immigration, contingent expense	1,005.60		543.76		363.05	1,186.31
Weather bureau	936.87		126.87		241.50	822.24
Solicitor-general, contingent expense	106.69		54.38		100.00	61.07
Printing tax books	627.95		217.50		493.00	352.45
Superintendent of public instruction:						
Rent	5.33					5.33
Contingent expense	173.33		90.63		46.25	217.71
Treasurer's contingent expense	224.98		181.25		122.93	283.30
Governor's contingent expense	3,962.94		543.76			4,506.70
Transportation of convicts	18.54		906.27		924.81	
Printing poll books	344.97					344.97
Furnishing normal school, Silver City	95.94					95.94
Reimbursing public land board	1,850.36	2,139.78	476.52		374.00	4,092.66

STATEMENT F.—*Quarterly statement, covering the second quarter of the fifty-fourth fiscal year, commencing March 1, 1903, and ending May 31, 1903*—Continued.

Title of fund or accouut.	Balances Mar. 1, 1903.	Receipts during quarter.	Transfers to funds.	Transfers from funds.	Warrants drawn.	Balances May 31, 1903.
Furnishing normal school, Las Vegas	$428.18	.....	$317.68	.....	$427.41	$318.45
Money's Digest South Carolina Reports	13.29	.....	.....	.....	.....	13.29
Agricultural college, income	134.57	.....	.....	.....	101.38	33.19
Normal School:						
Silver City, income	358.84	.....	.....	$100.00	.....	258.84
Las Vegas, income	.....	.....	.....	.....	.....	.....
School of mines, income	225.27	.....	.....	.....	.....	225.27
Military institute, income	356.13	.....	.....	100.00	.....	256.13
Reform school, income	355.87	.....	.....	100.00	.....	255.87
Blind asylum, income	412.90	.....	.....	100.00	.....	312.90
Deaf and dumb asylum, income	385.43	.....	.....	.....	.....	385.43
Miners' hospital, income	355.69	$32.00	.....	100.00	.....	287.69
Insane asylum, income	442.27	30.80	.....	.....	442.77	30.80
Penitentiary, income	94.26	.....	.....	.....	93.97	.29
Water reservoir, permanent	60.00	.....	.....	.....	.....	60.00
Territorial purposes, fifty-fourth fiscal year	2,662.18	10,798.26	343.85	10,504.29	3,300.00	.....
Territorial institutions, fifty-third fiscal year	.....	3,282.37	213.35	3,495.72	.....	.....
Charitable institutions, fiscal year	3,924.03	581.80	8.44	3,486.77	800.29	227.21
Special purposes, fifty-fourth fiscal year	571.94	234.62	83.88	794.20	.....	96.24
Territorial purposes, fifty-third fiscal year	.....	230.93	.....	230.93	.....	.....
Territorial institutions, fifty-third fiscal year	.....	134.64	.....	134.64	.....	.....
School of mines, permanent	.....	1,386.60	.....	.....	1,386.60	.....
Penitentiary, permanent	145.95	2,826.96	.....	500.00	1,458.88	1,014.03
Normal University:						
Las Vegas, permanent	.....	6,066.60	.....	1,500.00	.....	4,566.60
Silver City, permanent	1,200.00	6,066.60	.....	2,500.00	.....	4,766.60
Deaf and dumb asylum, permanent	.....	2,646.60	.....	.....	.....	2,646.60
Special purposes, fifty-third fiscal year	65.42	14.29	.....	79.71	.....	.....
Geological survey	10,325.15	244.19	3.58	.....	.....	10,572.92
Exposition fund	12,514.70	3,819.97	5.72	16,191.07	.....	149.32
Provisional indebtedness, bond sinking fund	33,476.41	493.19	7.15	.....	.....	33,976.75
Capitol building, bond sinking fund	109,132.16	1,459.67	21.45	.....	.....	110,613.28
Reform school, permanent	.....	10,581.00	.....	3,500.00	.....	7,081.00
Certificates of indebtedness	18,334.37	983.15	14.30	.....	.....	19,331.82
Blind asylum, permanent	32.14	7,874.16	.....	2,500.00	.....	5,406.30
Temporary provisional indebtedness fund	.....	.....	16,191.07	4,000.00	9,314.64	2,876.43
Maintenance board of public lands	.....	.....	4,500.00	500.00	520.25	3,479.75
Palace income fund	.....	1,817.34	.....	.....	.....	1,317.34
Total	374,388.70	81,238.57	65,017.87	65,017.87	102,831.93	352,795.34

RECAPITULATION.

Balances March 1, 1903	$374,388.70
Receipts during quarter	81,238.57
	455,627.27
Warrants drawn during quarter	102,831.93
Balances May 31, 1903	352,795.34

NOTE.—Payments of interest coupons, maturing bonded indebtedness, certificates of indebtedness, cattle indemnity, and sheep sanitary funds and exposition funds are made direct by treasurer, and no warrants against these funds are drawn by auditor. Payments made from such funds are only charged against same in the office of the auditor at the time of the annual burning of warrants, the last occurring November 16, 1902.

I certify the above statement to be true and correct.

W. G. SARGENT,
Territorial Auditor.

SANTA FE, N. MEX., *June 1, 1903.*

STATEMENT G.—*Summary.*

Balance in hands of treasurer June 1, 1902		$315,717.55
Receipts during third quarter fifty-third fiscal year	$185,272.32	
Receipts during fourth quarter fifty-third fiscal year	47,326.90	
Receipts during first quarter fifty-fourth fiscal year	237,573.07	
Receipts during second quarter fifty-fourth fiscal year	81,238.57	
		551,410.86
Total to be accounted for by treasurer		867,128.71
Warrants drawn by auditor during third quarter fifty-third fiscal year	101,817.57	
Warrants drawn by auditor during fourth quarter fifty-third fiscal year	51,227.13	
Paid direct by treasurer (see note)	152,077.22	
Warrants drawn by auditor during first quarter fifty-fourth fiscal year	106,379.52	
Warrants drawn by auditor during second quarter fifty-fourth fiscal year	102,831.93	
		514,333.37
Total balances in hands of treasurer June 1, 1903		352,795.34

NOTE.—Warrants against cattle indemnity fund, sheep sanitary fund, and St. Louis Exposition fund are drawn direct on treasurer; also payment of maturing interest on bonded Territorial debt, the redemption of certificates of indebtedness ($24,500 1st day of March each year), with interest thereon, and the payments of any maturing Territorial bonded indebtedness are made direct by treasurer and only charged up against these funds or accounts in the office of the auditor when the "annual burning of warrants" takes place, the last occurring November 16, 1902, and from which date no charges of payments made from such funds or accounts by treasurer have been made in the office of the Territorial auditor.

STATEMENT H.—*Assessed valuation of the Territory for the years 1901 and 1902.*

Counties.	1901.				1902.			
	Assessed valuation.	Arithmetical product.	Cash product.	Percentage collected.	Assessed valuation.	Arithmetical product.	Cash product.	Percentage collected.
Bernalillo	$4,017,850.00	$57,415.08	$38,651.00	67.3	$3,893,585.00	$54,471.25	$20,280.48	37.2
Chaves	2,596,299.00	37,101.13	33,623.87	90.6	2,789,377.00	39,023.38	18,370.99	47.0
Colfax	2,713,302.00	38,773.08	33,501.14	86.4	2,798,074.00	39,145.06	18,769.94	47.8
Doña Ana	1,985,470.00	28,372.36	19,948.12	70.3	2,063,326.00	28,865.93	11,886.13	41.1
Eddy	1,657,720.00	23,688.81	21,925.52	92.1	1,858,049.00	25,994.11	12,312.96	47.3
Grant	3,108,427.50	44,419.43	36,281.80	81.7	2,826,735.30	39,546.02	19,724.49	49.8
Guadalupe	975,831.00	13,944.63	6,831.05	48.9	1,187,882.40	16,618.48	5,812.41	34.9
Lincoln	1,164,759.00	16,644.41	14,362.04	86.3	1,162,340.00	16,261.14	7,377.11	45.3
Luna	1,284,408.65	18,354.20	16,988.20	92.5	1,396,673.65	19,539.46	9,213.06	47.1
Mora	941,622.00	13,455.78	10,043.60	74.6	960,015.00	13,430.60	4,658.37	34.6
McKinley	1,179,083.00	16,849.10	10,325.26	61.2	957,361.00	13,393.49	5,823.47	43.4
Otero	1,038,307.14	14,837.41	13,309.84	89.7	1,199,429.51	16,780.01	7,838.93	46.7
Rio Arriba	791,669.00	11,312.94	6,161.82	54.4	834,681.00	11,677.19	4,344.21	37.2
San Juan	529,703.00	7,569.45	4,714.45	62.3	530,240.00	7,418.06	3,129.99	42.1
San Miguel	3,805,772.00	54,384.48	40,036.07	73.6	4,368,200.00	61,111.12	19,865.82	32.5
Santa Fe	1,808,071.00	25,837.33	17,684.97	68.4	2,037,390.00	28,503.09	10,364.64	36.3
Sierra	1,323,762.15	18,916.56	16,117.10	85.2	1,476,827.80	20,660.81	8,136.24	39.3—
Socorro	1,922,450.00	27,471.81	17,987.80	65.4	1,959,740.00	27,416.77	7,388.90	26.9
Taos	412,658.00	5,896.88	5,704.41	96.7	591,746.00	8,278.53	3,490.09	42.1
Union	1,869,883.00	26,720.63	16,735.35	62.6	1,931,210.00	27,017.63	14,832.81	54.9
Valencia	1,850,000.50	26,436.50	10,253.23	38.8	1,811,110.61	25,337.43	6,837.01	23.0
Total	36,977,047.94	528,402.00	391,186.64	74.0	38,633,993.27	540,489.56	220,897.10	40.8+
Tax levies		14.29				13.99		

Increased assessed valuation, year 1902 over year 1901, $1,656,945.33. Collection of taxes for year 1902 includes collections only on account of first half.

STATEMENT I.—*Statement showing the business done in the Territory of New Mexico by fire, life, and miscellaneous insurance companies during the year ending December 31, 1902.*

LIFE INSURANCE COMPANIES.

Name of company.	Location of principal office.	Number of policies in force Dec. 31, 1902.	Amount of policies in force Dec. 31, 1902.	Number of policies issued during 1902.	Amount of policies issued during 1902.	Losses incurred during 1902.	Losses paid during 1902.	Amount of premiums received during 1902.	Policies ceased during year 1902.
Ætna Life Insurance Co	Hartford, Conn	.....	$55,500.00	.....	.....	$511.92	$528.17	$428.70	.....
Conservative Life Insurance Co	Los Angeles, Cal	7	15,940.00	2	$4,500.00	.....	.....	292.14	$6,076.00
Equitable Life Insurance Co	New York City, N. Y	895	2,186,742.00	201	405,042.00	6,250.00	5,250.00	72,368.01	194,610.00
Hartford Life Insurance Co	Hartford, Conn	13	27,400.00	6	8,000.00	.....	.....	952.25	.....
Germania Life Insurance Co	New York City, N. Y	289	569,631.00	105	178,600.00	3,000.00	3,150.00	21,347.68	70,275.00
Manhattan Life Insurance Co	do	21	37,500.00	12	16,500.00	.....	.....	1,495.79	9,000.00
Mutual Life Insurance Co	do	1,507	3,965,193.00	286	564,635.00	85,247.58	76,685.58	119,958.61	458,520.00
National Life and Trust Insurance Co	Des Moines, Iowa	47	37,600.00	47	.....	.....	.....	3,570.84	.....
Northwestern Life and Savings Insurance Co	do	94	68,500.00	96	69,700.00	.....	.....	7,629.50	1,200.00
New York Life Insurance Co	New York City, N. Y	1,455	4,324,147.00	236	512,224.00	14,998.20	18,603.20	132,630.29	264,820.00
Northwestern Mutual Life Insurance Co	Milwaukee, Wis	252	632,074.00	32	72,800.00	.....	.....	18,141.60	98,475.00
Ocean Accident and Guaranty Insurance Co	New York City, N. Y	.....	168,000.00	.....	.....	.....	.....	780.32	.....
Penn Mutual Life Insurance Co	Philadelphia, Pa	.....	.....	.....	.....	.....	.....	.....	.....
Provident Savings Life Assurance Society	New York City, N. Y	57	236,317.00	37	168,710.00	.....	.....	5,351.74	11,928.00
Pacific Mutual Life Insurance Co	San Francisco, Cal	22	40,200.00	10	9,000.00	2,500.00	2,500.00	1,525.70	4,250.00
Union Mutual Life Insurance Co	Portland, Me	146	258,243.02	5	8,857.20	4,000.00	4,000.00	8,436.78	55,500.00
Union Central Life Insurance Co	Cincinnati, Ohio	361	871,637.00	217	578,762.00	5,700.00	5,700.00	28,286.18	78,500.00
State Life Insurance Co	Indianapolis, Ind	93	384,000.00	50	155,000.00	.....	.....	14,262.09	54,000.00
Security Trust and Life Insurance Co	New York City, N. Y	9	11,536.00	3	3,000.00	.....	.....	627.84	3,618.00
Standard Life and Accident Insurance Co	Detroit, Mich	.....	.....	.....	.....	.....	.....	.....	.....
Travelers Life Insurance Co	Hartford, Conn	27	52,382.00	5	5,274.00	.....	.....	1,940.22	1,000.00
Washington Life Insurance Co	New York City, N. Y	216	499,532.00	125	335,250.00	15,232.40	15,232.40	22,000.16	189,371.00

STATEMENT I.—*Statement showing the business done in the Territory of New Mexico by fire, life, and miscellaneous insurance companies during the year ending December 31, 1902*—Continued.

FIRE INSURANCE COMPANIES.

Name of company.	Location of principal office.	Amount of risks written during 1902.	Losses incurred during 1902.	Losses paid during 1902.	Amount premiums received during 1902.
Atlas Assurance Co. (Limited)	Chicago, Ill.	$500,423.00	$1,706.99	$2,604.96	$9,581.45
American Central Fire Insurance Co	St. Louis, Mo	356,645.00	1,473.10	1,804.00	6,880.90
British America Assurance Co	Toronto, Canada	469,160.00	5,229.49	4,702.72	9,594.14
Continental Insurance Co	New York City, N. Y	256,125.00	2,888.23	1,363.23	4,932.28
Fire Association of Philadelphia	Philadelphia, Pa	504,973.00	5,825.40	5,374.18	8,970.19
Firemen's Fund Insurance Co	San Francisco, Cal	1,591,587.00	11,363.54	11,116.99	26,179.51
Hartford Fire Insurance Co	Hartford, Conn	1,240,310.00	6,157.07	5,653.93	25,082.77
Insurance Company of North America	Philadelphia, Pa	655,152.00	8,860.48	7,164.36	13,802.18
Liverpool and London and Globe Insurance Co	New York City, N. Y	1,693,831.00	6,797.31	5,797.31	13,732.33
London and Lancashire Fire Insurance Co	do	460,027.00	4,470.50	3,790.50	9,352.50
North British and Mercantile Insurance Co	do	370,129.00	1,258.61	1,811.31	7,518.18
National Fire Insurance Co	Hartford, Conn.	1,256,830.22	8,302.64	8,353.61	20,700.77
Northern Assurance Co	New York City, N. Y	418,847.49		1,205.46	6,305.55
Norwich Union Fire Insurance Co	do	464,864.00	4,042.52	3,463.55	10,080.86
Niagara Fire Insurance Co	do	481,402.00	3,790.20	8,790.20	10,236.80
Orient Fire Insurance Co	Hartford, Conn	288,703.00	913.88	903.88	5,913.94
Palatine Insurance Co. (Limited)	New York City, N. Y	683,469.00	2,434.28	1,174.28	14,095.80
Scottish Union and National Insurance Co	Hartford, Conn	610,425.00	5,718.64	7,154.84	12,056.06
St. Paul Fire and Marine Insurance Co	St. Paul, Minn	436,620.00	3,230.72	2,632.03	6,942.17
Springfield Fire and Marine Insurance Co	Springfield, Mass	1,106,007.00	8,089.13	6,907.55	16,226.24
Royal Fire Insurance Co	New York City, N. Y	1,308,203.61	12,510.12	11,593.12	24,682.43
Ætna Fire Insurance Co	Hartford, Conn	396,335.00	78.65	78.65	7,573.92

MISCELLANEOUS INSURANCE COMPANIES.

Name of company.	Location of principal office.	Kind.	Amount of risks written during year 1902.	Amount of premiums received during year 1902.	Losses incurred during year 1902.	Losses paid during year 1902.	Amount at risk Dec. 31, 1902.
American Bonding Co	Baltimore, Md	Surety	$194,500.00	$961.00			$342,362.39
American Surety Co	New York City, N. Y	Fidelity and surety	64,500.00	141.49			63,500.00
Continental Casualty Co	Hammond, Ind	Accident	1,630,890.00	24,613.08	$17,799.79	$16,149.79	1,124,132.00
Fidelity and Casualty Co	New York City, N. Y						
Fidelity and Deposit Co	Baltimore, Md	Fidelity and surety	126,500.00	551.50			
Lloyds Plate Glass Insurance Co	New York City, N. Y	Plate glass	37,404.20	1,095.45	595.90	633.42	34,279.20
Metropolitan Plate Glass Insurance Co	do	do	20,088.50	613.80	329.10	329.10	
New York Plate Glass Insurance Co	do						
Union Casualty and Surety Co	St. Louis, Mo	Accident, health, and plate glass.	74,771.00	646.23	174.93	174.93	67,571.00
U. S. Fidelity and Guaranty Co	Baltimore, Md	Burglary, fidelity and surety.	542,957.38	2,722.50	1.19	1.19	2,510,316.10
Travelers Life Insurance Co	Hartford, Conn	Accident	224,803.00	2,626.53	3,663.99	3,663.99	224,803.00

STATEMENT J.—*Report of the Pullman Company.*

In accordance with the provisions of section 4 of an act of the Territorial legislature, entitled "An act to regulate the manner of taxing sleeping-car and other companies," approved February 23, 1893, the Pullman Company submits the following report for the year ending March 1, 1903:

1. The total number of cars operated by said company in the Territory of New Mexico for the year ending March 1, 1903, was 28.

2. The names of the counties through which said cars were run and the number of miles in each county are:

	Miles.		Miles.
Bernalillo County	61	Otero County	102
Chaves County	106	Rio Arriba County	69
Colfax County	58	San Miguel County	74
Doña Ana County	137	Santa Fe County	41
Grant County	55	Sierra County	50
Guadalupe County	104	Socorro County	87
Lincoln County	77	Union County	116
Luna County	94	Valencia County	160
McKinley County	71		
Mora County	37	Total	1,499

3. The number and kinds of cars so run and operated were as follows: Standard sleepers, 19; tourist cars, 9.

4. The gross earnings received from the use of such cars between points in the Territory of New Mexico during the year ending March 1, 1903, were $16,008. Tax on above earnings, at 2½ per cent, $400.20.

STATEMENT K.—*Statement of Wells Fargo Company's Territorial intrastate business in New Mexico, April 1, 1902, to March 31, 1903.*

County.	Office.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
Bernalillo	Albuquerque	$233.90	$226.35	$228.00	$313.30	$238.50	$299.35	$294.52	$232.90	$282.15	$246.60	$245.65	$308.70
	Bernalillo	23.80	20.25	38.65	35.55	40.35	37.55	26.95	23.29	20.35	15.25	15.00	20.05
	Isleta	6.10	2.75	16.00	21.10	22.20	20.10	13.55	9.15	14.90	11.65	11.70	9.27
	Thornton	10.25	13.10	17.85	28.30	23.20	13.20	13.45	21.27	22.20	13.18	9.75	10.25
Chaves	Hagerman	23.45	22.05	52.15	55.85	64.40	37.45	26.30	11.65	15.85	17.95	17.53	26.10
	Portales	7.50	17.80	15.60	11.25	12.30	14.17	18.70	137.50	150.00	20.65	10.80	13.90
	Roswell	57.40	104.45	101.30	96.85	95.00	71.25	73.04	72.05	99.60	45.34	44.32	65.56
Colfax	Dawson				8.35	42.45	42.60	31.50	31.60	10.10	11.75	8.13	30.10
	Dillon		2.45	7.55	2.75	4.45	13.15	3.60	.55	1.35	1.45		
	Dorsey	4.80	3.60	7.05	7.25	8.05	5.35	.30					
	French	1.70	37.00	38.40	30.75	8.70	3.10	12.50	24.25	4.60	2.75	14.85	.50
	Hebron							4.75	3.90	4.20	8.90	5.05	6.80
	Maxwell City	25.20	29.85	28.68	14.65	14.40	23.05	5.90	10.65	5.65	8.42	5.70	6.30
	Raton	56.20	55.40	62.10	116.25	176.43	163.05	118.50	77.65	95.30	86.10	56.05	81.80
	Springer	128.80	112.95	107.90	131.25	99.35	131.31	67.26	46.95	91.71	58.02	66.65	55.95
Doña Ana	Earlham	.25	1.80	.55									
	Hatch	2.40	3.40	3.00	6.17	2.65	4.45	7.55	2.80	4.05	3.20	2.25	2.65
	Las Cruces	25.35	38.97	25.50	27.05	24.32	41.95	55.62	39.70	48.43	29.50	31.71	37.65
	Laguna	1.40		1.50	2.00	.65	1.25						
	Mesilla	9.20	9.94	8.05	5.30	4.40	13.15	14.43	16.15	7.80	8.14	9.55	12.15
	Rincon	23.15	20.70	24.50	24.06	14.40	6.70	3.65	7.50	13.10	5.97	7.07	9.25
	Veda				3.40	2.50	3.45	1.00	.25	.25	1.00	1.30	.55
Eddy	Carlsbad	40.38	67.50	58.55	73.00	52.85	64.75	60.55	54.75	58.80	77.54	50.20	64.95
	Florence	4.10	13.05	11.35	21.20	6.30	3.45	4.10	11.09	4.05	4.95	4.15	5.10
Grant	Bayard	7.15	2.30	12.00	3.10	1.75	6.30	1.75	1.40	4.90	1.40	2.95	2.50
	Fierro	6.23	21.85	9.75	21.55		11.45	7.00	6.20	3.55	7.80	11.60	9.80
	Lordsburg	27.40	8.75	12.05	10.00	9.35	67.10	11.75	13.65	7.65	11.40	12.90	13.00
	Santa Rita	13.30	17.40	3.65	5.83	19.08	10.35	11.45	15.65	48.60	35.80	26.30	27.10
	Separ	2.55	3.05	2.05	1.65	6.03	3.50	3.95	3.05	1.45	1.70	.30	2.00
	Silver City	42.45	35.25	55.00	73.30	52.75	49.50	36.85	56.35	62.60	33.50	30.35	34.30
	Steins Pass	7.55	3.45	4.05	10.35	10.35	11.45	9.90	5.45	7.40	1.90	3.00	2.80
	Whitewater	4.85	4.15	4.90	9.15	10.70	5.95	3.15	2.15	2.00	6.40	8.55	11.30
Guadalupe	Pastura		3.90	1.40	3.25	9.05	8.55	13.20	11.40	3.85	3.25	3.45	9.05
	Santa Rosa	38.73	26.75	8.85	47.55	8.95	29.48	14.95	7.35	46.72	21.20	9.54	13.25
Lincoln	Ancho	1.65	2.80	1.50	3.00				6.50		.65	1.95	6.76
	Capitan	11.20	19.60	8.90	61.10	17.65	7.05	6.45	6.75	8.55	5.65	5.95	6.28
	Carrizozo	15.70	15.19	17.30	41.80	23.04	28.20	18.80	16.10	25.70	6.20	8.40	18.65
	Corona	37.26	8.61	8.65	2.50	8.50	7.00	3.95	1.62	20.75	8.88	10.55	9.50
	Oscura		10.98	30.30	11.85				3.05	1.80	2.20	5.70	5.05
	Torrance		1.40	3.45	2.05	10.12	13.11	3.40	2.65	8.93	99.05	28.25	8.50
	Walnut								3.30	5.16	2.20	.65	1.45
Luna	Deming	92.88	45.21	54.15	44.15	67.85	39.55	51.75	23.17	45.66	71.07	61.03	58.20
	Florida	5.95	2.35	5.00	10.70	10.90	9.08	12.95	10.40	5.10	7.55	8.10	8.25
	Gage	2.40	1.90	3.15	2.95	2.15	.85	1.25	2.15	4.05	1.70		
	Nutt			.85	.35	1.20	2.35	3.35	.75	.60	2.10	.25	

STATEMENT K.—*Statement of Wells Fargo Company's Territorial intrastate business in New Mexico, April 1, 1902, to March 31, 1903*—Continued.

County.	Office.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
McKinley	Gallup	$428.32	$398.25	$324.50	$399.60	$424.35	$360.25	$234.25	$324.36	$302.45	$294.30	$294.25	$224.75
	Manuelito	10.92	5.75	6.85	4.15	11.65	22.35	9.35	18.65	20.05	6.15	4.15	3.25
	Wingate	28.80	51.20	19.75	12.90	17.05	7.65	28.85	16.20	23.95	22.65	8.25	51.90
Mora	Wagonmound	13.09	16.05	45.84	70.78	78.31	52.99	35.90	21.20	23.20	17.42	16.45	31.00
	Watrous	130.35	159.05	74.70	104.45	93.30	70.20	65.16	53.57	20.10	30.93	26.50	51.06
Otero	Alamogordo	29.10	41.75	45.70	45.03	37.60	43.25	32.40	39.20	47.80	30.30	54.39	117.59
	Cloudcroft	14.70	14.15	9.95	17.50	18.22	19.55	11.80	7.45	13.00	7.45	3.85	8.05
	Hereford										.65		.25
	Jarilla Junction	2.05	3.05	5.30	2.05	3.75	9.30	5.05	2.55	2.45	3.70	3.45	5.15
	Tularosa	9.10	11.20	14.75	13.60	17.10	10.60	25.82	8.35	6.30	4.60	2.00	5.10
San Miguel	Fulton	2.45	4.45	1.50	6.75	4.05	3.88	9.00	7.30	7.30	2.90	1.15	1.75
	Hot Springs	2.23	.65	.25	3.65	1.80	.25	1.65	1.50	4.45	1.50	.55	1.25
	Las Vegas	136.78	188.72	156.65	390.87	407.10	464.40	281.16	139.07	139.43	117.85	94.43	108.82
	Ribera	7.50	10.25	12.45	9.41	26.51	5.05	12.05	10.30	13.35	11.05	10.25	11.60
	Rowe	7.15	7.95	18.79	18.34	18.45	13.42	11.24	14.05	11.30	10.90	6.25	7.70
Santa Fe	Cerrillos	61.50	66.20	106.40	107.50	125.30	94.05	60.35	43.85	47.25	27.32	37.25	48.10
	Glorieta	9.85	10.90	7.75	19.75	13.99	13.45	16.00	9.45	20.80	11.45	17.25	10.15
	Lamy	14.52	14.55	22.00	13.00	10.40	19.05	9.55	12.10	17.85	12.65	10.20	12.80
	Santa Fe	271.02	270.50	281.34	248.85	277.71	297.98	279.56	213.30	274.68	222.00	233.48	228.59
	Waldo	28.85	79.80	2.20	108.85	45.90	92.45	32.10	51.35	58.40	38.95	52.60	53.20
Sierra	Engle	11.95	20.20	20.50	26.80	16.60	17.40	12.35	19.10	17.80	6.70	18.40	16.05
	Lake Valley	9.02	10.90	15.30	18.30	16.35	19.10	8.80	7.20	20.20	9.50	7.40	17.95
	Lajoya	4.40	4.55	2.55	2.49	5.05	7.75	2.45	3.40	2.60	1.90	2.85	.70
	Lava	6.60	9.50	10.25	3.80	3.75	5.95	1.55	2.80	5.00	5.00	.65	3.20
Socorro	Magdalena	38.90	51.04	47.41	72.12	66.71	41.60	42.25	56.35	68.79	36.15	64.45	48.70
	San Antonio	15.40	23.75	16.20	14.55	7.10	15.20	17.35	16.25	25.58	16.65	16.45	21.90
	San Marcial	61.40	51.30	44.76	53.35	64.74	47.96	49.99	47.25	48.06	41.09	37.00	39.50
	Socorro	66.15	108.43	80.35	92.80	62.00	67.00	51.20	102.00	74.80	73.75	54.10	74.20
Union	Clayton	7.30	9.65	7.35	6.85	7.10	7.95	10.50	8.35	11.60	7.15	6.30	5.60
	Folsom	7.06	6.10	8.55	3.90	10.20	3.20	1.55	6.70	2.25	2.45	1.40	8.78
Valencia	Belen	24.10	29.90	34.65	66.70	94.25	106.20	62.75	27.10	61.05	124.55	309.55	290.65
	Grant	22.70	25.45	48.60	49.47	67.20	5.65	50.05	37.01	18.75	20.45	16.75	21.35
	Laguna	11.11	19.70	22.07	52.56	39.00	34.35	13.50	37.92	39.65	26.20	16.50	14.55
	Los Lunas	12.55	11.80	28.90	29.75	29.20	18.30	18.45	19.45	22.50	14.15	23.15	25.35
	Manzano	9.70	7.45	3.10	5.95	1.85	11.60	8.25	4.60	5.75	3.10	4.80	3.95
Total		2,519.20	2,792.39	2,648.39	3,497.23	3,246.76	3,333.51	2,585.80	2,423.97	2,753.95	2,273.42	2,312.63	2,584.30

Total intrastate business April 1, 1902, to March 31, 1903	$32,971.55
Total amount paid railway companies for transportation	90,009.37
Amount paid railway companies in excess of revenue earned for that period	57,037.82

REPORT OF THE TRAVELING AUDITOR AND BANK EXAMINER.

By CHAS. V. SAFFORD.

On March 19 I received notice of my appointment, and within a very short time thereafter assumed the duties of the office to which I had been appointed by qualifying and filing my official bond.

Since actively entering upon the discharge of my duties (April 1, 1903) all of the counties of the Territory have been personally visited with the exception of one, and in some instances, when necessary, two and three times, and full and complete settlements made with the treasurers and ex-officio collectors as to the Territorial proportion of the 1902 tax—delinquent Territorial tax for 1901 and prior years having been by the same act creating this office made the property of the several counties of the Territory for the benefit of the general county expense and school funds. In all cases of settlement statements properly certified to have been filed in the office of the Territorial auditor, which official has charge of these accounts.

In a number of the counties a complete check of all receipts and disbursements has been made, not only of the accounts of the present collectors, but also of their immediate predecessors, with more or less satisfactory results.

It might be well to call attention to the fact that the receipts from tax levies, both county and Territory, have been very materially increased, and without doubt, to a very great extent, is due to the work of this office. As an example, the receipts by the Territorial treasurer from tax collections for the months of May and June last year amounted to $136,311.70 on the tax of 1901, while for the corresponding months of the present year the receipts from 1902 tax amounted to $158,636.97, an increase of over 16 per cent for those two months.

It is expected that a large increase in the per cent of collections will be the result at the end of our fiscal year, November 30, over any preceding year.

I am now putting into effect a uniform system of bookkeeping in all of the counties of the Territory, and in many of the counties the change from systems heretofore in use will be of great benefit. It is hoped to have this matter of the uniform keeping of accounts by county officials in force by the end of the present year.

While visiting the several counties of the Territory in connection with settlements with county treasurers a careful supervision has been exercised over the assessments made by county assessors, and the result will not only be a good increase in assessed valuation in some of the counties, but the rolls will be returned to the auditor in much better and more complete condition than heretofore. The assessment of property for taxation purposes had already been in progress some time before the creation of this office, and owing to lack of time it was impossible to reach some of the counties until after the assessment had been completed, and the bettered condition as to increased valuation will be shown by the counties that were reached before the completion of the assessment.

As to my duties as State bank examiner, owing to the limited time, I have been unable to make personal examination of such institutions, but our Territorial banks seem to be in flourishing condition, as will be seen by tabulation attached, compiled from "statements of condition," sent in response to call under date of June 30.

State banks.

Name and location of bank.	Resources.				
	Loans and discounts.	Bonds and stocks.	Bank building and real estate.	Cash and sight exchange.	Aggregate.
Sierra County Bank, Hillsboro	$137,338.92	.....	$2,580.00	$43,772.41	$183,691.33
Las Vegas Savings Bank, Las Vegas	110,588.65	.....	6,500.00	22,852.09	139,940,74
S. T. Bitting, Carlsbad	94,736.51	.....	2,000.00	36,327.10	133,063.61
Silver City Savings Bank, Silver City	35,380.00	$31,533.75	.....	1,325.48	68,239.23
Plaza Trust and Savings Co., Las Vegas	22,612.38	.....	3,000.00	19,154.36	44,766.74
Andrew Morton, Springer	22,582.00	.....	.....	19,201.00	41,783.00
Bank of Deming, Deming	132,022.68	5,000.00	7,958.00	93,534.68	238,515.36
Bank of Commerce, Albuquerque	803,678.74	.....	12,054.95	280,581.13	1,096,314.82
Exchange Bank, Whiteoaks	84,808.00	.....	1,578.00	28,083.00	114,469.00
Bank of Portales, Portales	39,250.20	.....	7,482.27	11,220.67	57,953.14
Total	1,482,948.08	36,533.75	43,153.22	556,051.92	2,118,686.97

State banks—Continued.

Name and location of bank.	Liabilities.			Dividends paid.
	Capital stock.	Surplus and profits.	Deposits.	
				Per cent.
Sierra County Bank, Hillsboro	$30,000.00	$2,563.50	$151,127.83	10
Las Vegas Savings Bank, Las Vegas	30,000.00	2,564.37	107,376.37	8
S. T. Bitting, Carlsbad	40,000.00	267.74	92,795.87	10
Silver City Savings Bank, Silver City	15,000.00	83.21	53,156.02	.....
Plaza Trust and Savings Co., Las Vegas	15,000.00	184.67	29,582.07	.....
Andrew Morton, Springer	5,000.00	919.00	35,814.00	.....
Bank of Deming, Deming	30,000.00	10,665.91	197,849.45	10
Bank of Commerce, Albuquerque	72,400.00	32,650.12	991,264.70	.....
Exchange Bank, Whiteoaks	30,000.00	4,541.00	79,928.00	16⅔
Bank of Portales, Portales	30,000.00	2,032.24	25,920.90	10
Total	297,400.00	56,471.76	1,764,815.21	.....

BANKS.

Statements of the different banks throughout the Territory of New Mexico, showing their condition at the close of business on June 30, 1903.

Name and location of bank.	Resources.	Liabilities.
First National Bank, Albuquerque	$2,444,457.77	$2,444,457.77
First National Bank, Santa Fe	872,999.38	872,999.38
First National Bank, Las Vegas	797,481.87	797,481.87
First National Bank, Roswell	611,441.57	611,441.57
First National Bank, Raton	425,375.60	425,375.60
First National Bank, Alamogordo	284,599.30	284,599.30
First National Bank, Carlsbad	284,048.38	284,048.38
First National Bank, Clayton	255,814.27	255,814.27
First National Bank, Portales	115,545.36	115,545.36
First National Bank, Tucumcari	98,903.75	98,903.75
First National Bank, Santa Rosa	89,858.96	89,858.96
First National Bank Farmington	84,077.00	84,077.00
First National Bank, Belen	65,480.23	65,480.23
San Miguel National Bank, Las Vegas	927,173.65	927,173.65
Silver City National Bank, Silver City	392,624.80	392,624.80
Citizens' National Bank, Roswell	310,716.33	310,716.33
Citizens' National Bank, Raton	203,459.65	203,459.65
National Bank of Carlsbad, Carlsbad	138,402.89	138,402.89
Roswell National Bank, Roswell	125,801.58	125,801.58
Sierra County Bank, Hillsboro	183,691.33	183,691.33
Las Vegas Savings Bank, Las Vegas	139,940.74	139,940.74
S. T. Bitting Bank, Carlsbad	133,063.61	133,063.61
Silver City Savings Bank, Silver City	68,239.23	68,239.23
Plaza Trust and Savings Bank, Las Vegas	44,766.74	44,766.74
Andrew Morton, Springer	41,733.00	41,733.00
Bank of Deming, Deming	238,515.36	238,515.36
Bank of Commerce, Albuquerque	1,096,314.82	1,096,314.82
Exchange Bank, Whiteoaks	114,469.00	114,469.00
Bank of Portales, Portales	57,953.14	57,953.14
J. N. Broyles, San Marcial	49,500.00	49,500.00
Total	10,696,449.31	10,696,449.31

FIRST NATIONAL BANK AT LAS VEGAS.

FIRST NATIONAL BANK AT DEMING.

FIRST NATIONAL BANK IN THE 2-YEAR-OLD TOWN OF TUCUMCARI.

Abstract of 1903 tax rolls.

	Counties.				
	Bernalillo.	Chaves.	Colfax.	Donna Ana.	Eddy.
Agricultural lands and improvements	$451,180.00	$393,253.00	$209,505.00	$479,999.00	$134,144.00
Grazing lands and improvements	73,772.00	199,662.00	528,451.00	127,266.00	126,196.00
City lots and improvements	1,554,905.00	560,595.00	446,010.00	199,327.00	179,878.00
Coal lands					
Timber lands					
Toll:					
Roads					
Bridges					
Telegraph and telephone lines	12,836.00	2,700.00	4,392.00		2,312.00
Irrigating ditches			4,000.00		
Reservoirs					
Railroads:					
Narrow gauge					
Broad gauge	267,963.00	122,000.00	523,373.00	915,322.00	252,998.00
Mines:					
Surface improvements	1,050.00		151,850.00	23,385.00	
Product					
Mills	6,300.00	1,000.00	1,500.00	11,500.00	
Notes and book accounts	16,350.00	36,672.00		5,990.00	6,650.00
Engines	55,100.00	4,760.00	100.00	3,840.00	
Horses	22,298.00	86,565.00	11,700.00	40,603.00	88,895.00
Mules	1,884.00	16,905.00	1,300.00	3,687.00	7,362.00
Cattle	14,418.00	858,727.00	438,022.00	169,898.00	790,843.00
Sheep	122,155.00	250,406.00	87,343.00	20,540.00	124,317.00
Goats	1,881.00	1,030.00		5,628.00	16,775.00
Swine	300.00	5,826.00		1,775.00	928.00
Burros	75.00	390.00		200.00	14.00
Carriages and wagons	15,781.00	27,854.00	3,475.00	13,061.00	16,215.00
Sewing machines	2,190.00	4,866.00		4,089.00	2,201.00
Saddles and harness	1,550.00	8,335.00	1,550.00	7,210.00	5,638.00
Merchandise	222,775.00	157,280.00	101,865.00	63,750.00	70,010.00
Capital in manufacturing		4,158.00			
Farm implements	2,029.00	6,429.00	3,575.00	17,689.00	3,645.00
Saloon and office fixtures	10,785.00	11,078.00	2,200.00	3,205.00	7,325.00
Money	1,680.00	96,942.00	5,000.00	2,090.00	2,895.00
Bonds and warrants	420.00			350.00	
Watches and clocks		4,443.00	550.00	1,236.00	1,303.00
Books	5,075.00	2,267.00	500.00	2,219.00	522.00
Jewelry	5,352.00	4,905.00	1,100.00	1,070.00	535.00
Gold and silver plate	750.00		300.00	320.00	123.00
Musical instruments	4,495.00	14,792.00	2,100.00	5,145.00	4,611.00
Household goods	56,220.00	48,337.00	100,200.00	19,344.00	16,323.00
Shares in banks	163,940.00			6,000.00	59,500.00
Wheat					
Corn and barley					200.00
Hay				215.00	25.00
Wool					
Lumber	6,200.00			1,500.00	5,425.00
Coal					
Tools	1,350.00	2,516.00	19,000.00	1,577.00	1,177.00
Bees		865.00			50.00
Other property not classified		3,460.00	332,450.00	12,419.00	8,819.00
Total valuation	3,103,120.00	2,939,012.00	2,981,411.00	2,189,899.00	1,937,914.00
Exemptions	197,270.00	113,851.00	140,400.00	112,200.00	89,835.00
Subject to taxation 1903	2,905,850.00	2,825,161.00	2,841,011.00	2,077,699.00	1,848,079.00
Subject to taxation 1902	3,893,585.00	2,789,377.00	2,798,074.00	2,063,326.00	1,858,049.00
Increase over 1902		35,784.00	42,937.00	14,373.00	
Decrease from 1902	987,735.00				9,970.00

Abstract of 1903 tax rolls—Continued.

	Counties.				
	Grant.	Luna.	Lincoln.	Leonard Wood.	McKinley.
Agricultural lands and improvements	$130,010.00	$26,879.00	$199,273.00	$15,748.00	$10,311.00
Grazing lands and improvements	137,020.00	46,588.00	107,866.00	227,456.00	296,556.00
City lots and improvements	432,525.00	211,759.00	103,249.00	60,872.00	127,195.00
Coal lands					60,055.00
Timber lands					
Toll:					
Roads					
Bridges					
Telegraph and telephone lines	4,962.00	1,647.60	350.00		6,449.00
Irrigating ditches					
Reservoirs					
Railroads:					
Narrow gauge					
Broad gauge	752,275.00	803,757.30			329,831.00
Mines:					
Surface improvements	113,015.00	15,111.00	96,400.00		21,850.00
Product	27,000.00				
Mills	45,890.00	1,000.00	1,655.00	300.00	
Notes and book accounts	6,030.00	1,150.00	12,490.00	100.00	
Engines		3,670.00	3,200.00		
Horses	75,005.00	16,775.00	55,032.00	25,914.00	5,090.00
Mules	3,870.00	410.00	7,895.00	2,830.00	3,325.00
Cattle	834,040.00	242,263.00	337,427.00	191,236.00	10,134.00
Sheep	3,750.00	30.00	109,132.00	300,627.00	10,500.00
Goats	15,250.00	2,885.00	36,064.00	2,683.00	
Swine	140.00	62.00	633.00	152.00	10.00
Burros	225.00	165.00	391.00	1,124.00	40.00
Carriages and wagons	18,255.00	6,418.00	22,551.00	7,622.00	4,636.00
Sewing machines	1,855.00	1,052.00	3,263.00	1,983.00	315.00
Saddles and harness	5,990.00	2,802.00	7,321.00	2,983.00	999.00
Merchandise	173,580.00	59,634.00	70,312.00	43,070.00	58,640.00
Capital in manufacturing		3,250.00			
Farm implements	2,340.00	295.00	3,361.00	1,658.00	165.00
Saloon and office fixtures	17,180.00	5,705.00	7,783.00	5,066.00	4,420.00
Money	10,980.00	570.00	32,477.00	8,935.00	50.00
Bonds and warrants		15.00			
Watches and clocks	1,510.00	473.00	1,985.00	300.00	245.00
Books	4,560.00	595.00	2,117.00	180.00	200.00
Jewelry	1,430.00	38.00	788.00	218.00	205.00
Gold and silver plate					
Musical instruments	5,150.00	3,260.00	6,285.00	765.00	1,300.00
Household goods	48,235.00	20,288.00	15,865.00	8,614.00	8,187.00
Shares in banks	24,210.00	18,415.00	100.00		
Wheat					
Corn and barley		10.00	1,560.00		
Hay		200.00	1,268.00		20.00
Wool					
Lumber	3,710.00		245.00	3,300.00	100.00
Coal					
Tools	3,475.00	335.00	2,282.00	309.00	340.00
Bees					
Other property not classified	9,610.00	5,185.00	98,132.00	8,979.00	6,989.00
Total valuation	2,912,977.00	1,502,691.90	1,348,802.00	923,017.00	968,107.00
Exemptions	76,600.00	34,000.00	80,000.00	52,947.00	26,957.00
Subject to taxation 1903	2,836,377.00	1,468,691.90	1,268,802.00	870,070.00	941,150.00
Subject to taxation 1902	2,828,735.30	1,396,673.65	1,162,840.00		957,361.00
Increase over 1902	9,641.70	72,018.25	106,462.00	870,070.00	
Decrease from 1902					16,211.00

Abstract of 1903 tax rolls—Continued.

	Counties.				
	Mora.	Otero.	Quay.	Rio Arriba.	Roosevelt.
Agricultural lands and improvements	$222,610.00	$117,973.00	$5,350.00	$837,891.00	.....
Grazing lands and improvements	293,718.00	67,312.00	71,872.00	.....	$76,822.00
City lots and improvements	25,346.00	394,022.00	76,152.00	.....	78,094.00
Coal lands	.....	.....	.....	.....	.....
Timber lands	.....	125,060.00	.....	.....	.....
Toll:					
Roads	.....	.....	.....	.....	.....
Bridges	.....	.....	.....	.....	.....
Telegraph and telephone lines	2,299.00	1,250.00	.....	3,027.00	475.00
Irrigating ditches	.....	7,968.00	300.00	.....	.....
Reservoirs	.....	10,570.00	.....	.....	.....
Railroads:					
Narrow gauge	.....	.....	.....	340,000.00	.....
Broad gauge	271,410.00	68,260.00	.....	.....	.....
Mines:					
Surface improvements	.....	4,235.00	.....	6,500.00	.....
Product	.....	.....	.....	.....	.....
Mills	.....	42,910.00	.....	1,660.00	.....
Notes and book accounts	3,100.00	11,358.00	5,836.00	300.00	1,270.00
Engines	17,850.00	3,090.00	.....	1,300.00	.....
Horses	27,975.00	66,798.00	30,989.50	16,944.00	13,429.00
Mules	5,760.00	4,586.00	7,195.00	555.00	17,903.00
Cattle	122,604.00	245,467.00	396,085.00	12,262.00	256,587.00
Sheep	73,492.00	39,330.00	66,454.50	144,820.00	8,625.00
Goats	3,437.00	34,981.00	620.00	.....	.....
Swine	306.00	1,800.00	138.00	183.00	1,089.00
Burros	175.00	378.00	155.00	746.00	26.00
Carriages and wagons	13,783.00	11,764.00	6,171.00	9,072.00	15,988.00
Sewing machines	2,457.00	3,649.00	1,164.00	1,620.00	3,015.00
Saddles and harness	4,662.00	5,323.00	2,910.00	4,259.00	4,865.00
Merchandise	55,835.00	87,204.00	45,135.00	66,630.00	50,902.00
Capital in manufacturing	.....	1,189.00	.....	.....	.....
Farm implements	6,170.00	2,477.00	2,193.25	3,416.00	3,591.00
Saloon and office fixtures	719.00	10,347.00	2,305.00	1,739.00	1,035.00
Money	688.00	10,222.00	3,543.97	465.00	31,398.00
Bonds and warrants	.....	1,287.00	.....	.....	.....
Watches and clocks	459.00	2,284.00	215.00	406.00	2,203.00
Books	689.00	888.00	109.00	263.00	300.00
Jewelry	559.00	369.00	.....	410.00	.....
Gold and silver plate	.....	.....	.....	.....	.....
Musical instruments	742.00	8,341.00	1,174.50	694.00	3,297.00
Household goods	15,777.00	21,765.00	5,159.00	13,217.00	13,597.00
Shares in banks	.....	27,600.00	25,536.00	.....	.....
Wheat	65.00	.....	.....	.....	.....
Corn and barley	410.00	240.00	.....	.....	.....
Hay	1,925.00	248.00	.....	125.00	.....
Wool	.....	.....	.....	.....	.....
Lumber	230.00	52,837.00	.....	5,900.00	.....
Coal	.....	.....	.....	.....	.....
Tools	572.00	1,962.00	490.00	1,500.00	612.00
Bees	.....	.....	.....	.....	.....
Other property not classified	.....	73,540.00	5,751.72	5,752.00	64,041.00
Total valuation	1,175,823.00	1,570,864.00	762,998.44	981,656.00	649,164.00
Exemptions	73,760.00	115,439.00	37,681.00	80,663.00	82,211.00
Subject to taxation 1903	1,102,063.00	1,455,425.00	725,317.44	900,993.00	566,953.00
Subject to taxation 1902	960,015.00	1,199,429.51	.....	834,681.00	.....
Increase over 1902	142,048.00	255,995.49	725,317.44	66,312.00	566,953.00
Decrease from 1902	.....	.....	.....	.....	.....

Abstract of 1903 tax rolls—Continued.

	Counties.				
	Sierra.	San Miguel.	Santa Fe.	Socorro.	Sandoval.
Agricultural lands and improvements	$32,138.00	$298,692.00	$895,359.00	$51,035.00	$155,827.00
Grazing lands and improvements	174,981.00	1,548,745.00	101,401.00	1,022,266.00	153,868.00
City lots and improvements	83,603.00	982,338.00	139,412.00	185,605.00	1,575.00
Coal lands					
Timber lands					
Toll:					
Roads		125.00			
Bridges					
Telegraph and telephone lines	4,148.80	5,631.00	7,767.70	2,440.00	2,297.00
Irrigating ditches	100.00				
Reservoirs	550.00				
Railroads:					
Narrow gauge		25,350.00	112,870.00		
Broad gauge	361,540.00	703,786.00	392,525.90		282,425.00
Mines:					
Surface improvements	30,770.00		47,325.00		12,046.00
Product	31,427.00				
Mills	4,050.00	40,587.00	12,810.00	10,365.00	3,585.00
Notes and book accounts	2,000.00	19,807.00	76,320.00		800.00
Engines	1,150.00	125.00	58,279.00	36,195.00	
Horses	59,789.00	55,298.00	22,274.00	65,115.00	12,605.00
Mules	2,280.00	3,305.00	310.00	2,915.00	1,700.00
Cattle	353,637.00	214,620.00	21,563.00	353,390.00	15,587.00
Sheep	23,532.00	243,303.00	70,624.00	124,710.00	49,241.00
Goats	29,799.00	11,246.00	9,889.00	13,500.00	2,539.00
Swine	441.00	445.00		25.00	226.00
Burros	745.00	745.00	1,096.00	365.00	335.00
Carriages and wagons	12,076.00	22,090.00	19,769.00	17,285.00	7,339.00
Sewing machines	3,124.00	5,476.00	4,027.00	2,935.00	1,148.00
Saddles and harness	6,872.00	7,763.00	4,552.00	9,025.00	2,386.00
Merchandise	45,510.00	221,597.00	119,229.00	88,660.00	20,115.00
Capital in manufacturing		2,675.00			
Farm implements	2,168.00	4,856.00	3,199.00	3,830.00	2,151.00
Saloon and office fixtures	2,305.00	13,699.00	6,560.00	4,735.00	450.00
Money	5,899.00	2,550.00	796.00		956.00
Bonds and warrants		1,700.00			23.00
Watches and clocks	1,716.00	2,312.00	1,712.00	1,390.00	364.00
Books	2,120.00	3,057.00	8,070.00	1,695.00	160.00
Jewelry	984.00	1,193.00	1,620.00	870.00	259.00
Gold and silver plate			3,307.00		
Musical instruments	2,582.00	6,283.00		3,030.00	315.00
Household goods	15,004.00	61,756.00	48,191.00	28,290.00	7,981.00
Shares in banks	18,000.00	112,645.00			85.00
Wheat		45.00			
Corn and barley		100.00			
Hay					20.00
Wool					
Lumber	140.00	780.00	810.00	245.00	200.00
Coal					150.00
Tools	1,823.00	864.00	1,593.00	1,555.00	220.00
Bees				280.00	50.00
Other property not classified	9,916.65	106,847.00	8,128.40	55,359.00	102,537.00
Total valuation	1,326,820.45	4,782,436.00	2,207,842.00	2,086,610.00	792,565.00
Exemptions	72,129.00	190,723.00	167,325.00	141,600.00	57,110.00
Subject to taxation 1903	1,254,791.45	4,541,713.00	2,040,517.00	1,945,010.00	735,455.00
Subject to taxation 1902	1,476,827.80	4,368,200.00	2,037,390.00	1,959,740.00	
Increase over 1902		173,513.00	3,127.00		735,455.00
Decrease from 1902	222,036.35			14,730.00	

Abstract of 1903 tax rolls—Continued.

	Counties.				
	San Juan.	Taos.	Union.	Valencia.	Guadalupe.
Agricultural lands and improvements	$362,629.00	$174,812.00	$482,866.00	$28,984.00	
Grazing lands and improvements		90,061.00		420,151.75	
City lots and improvements	78,665.00	6,566.00	20,354.00	44,962.00	
Coal lands					
Timber lands					
Toll:					
Roads		3,250.00	25.00		
Bridges	200.00				
Telegraph and telephone lines	1,332.00	1,175.00	400.00	7,189.25	
Irrigating ditches		3,200.00	150.00	500.00	
Reservoirs			200.00		
Railroads:					
Narrow gauge		146,990.00			
Broad gauge			414,585.00	444,963.00	
Mines:					
Surface improvements		15,832.00			
Product					
Mills	8,100.00	8,685.00		9,400.00	
Notes and book accounts	4,490.00	2,956.00		689.00	
Engines	370.00			1,900.00	
Horses	34,090.00	18,855.00	38,009.00	12,987.00	
Mules	1,925.00	295.00	665.00	3,785.00	
Cattle	64,799.00	16,698.00	449,474.00	23,179.00	
Sheep	22,497.00	103,466.00	502,585.00	226,498.00	
Goats	1,962.00	3,721.00		552.00	
Swine	945.00	529.00	115.00	119.00	
Burros	143.00	179.00	486.00	527.00	
Carriages and wagons	12,456.00	12,366.00	14,332.00	7,248.00	
Sewing machines	1,704.00	2,195.00	2,936.00	825.00	
Saddles and harness	4,873.00	4,176.00	6,925.00	2,725.00	
Merchandise	40,790.00	40,577.00	57,410.00	71,565.00	
Capital in manufacturing	1,800.00				
Farm implements	5,710.00	3,548.00	1,974.00	1,647.00	
Saloon and office fixtures	1,660.00	800.00	2,725.00	385.00	
Money	2,780.00	1,455.00	1,255.00	12,578.00	
Bonds and warrants	513.00		11,000.00	348.00	
Watches and clocks		416.00	1,584.00	332.00	
Books	282.00	380.00	870.00	575.00	
Jewelry		179.00			
Gold and silver plate	28.00		785.00		
Musical instruments	2,223.00	275.00	2,294.00	1,480.00	
Household goods	9,113.00	10,736.00	16,003.00	8,279.00	
Shares in banks	7,920.00		30,600.00	8,883.00	
Wheat	30.00			54.00	
Corn and barley	6.00				
Hay	105.00	750.00	440.00	40.00	
Wool					
Lumber	800.00		300.00	395.00	
Coal				16.00	
Tools	925.00	489.00	425.00	162.00	
Bees	302.00				
Other property not classified	8,324.00	2,213.00	10,368.00	15,963.00	
Total valuation	679,491.00	677,820.00	2,021,640.00	1,359,786.00	
Exemptions	84,985.00	99,000.00	74,390.00	34,539.00	
Subject to taxation, 1903	594,506.00	578,820.00	1,947,250.00	1,325,247.00	
Subject to taxation, 1902	530,240.00	591,746.00	1,931,210.00	1,811,110.61	
Increase over 1902	64,266.00		16,040.00		
Decrease from 1902		12,926.00		485,863.61	$1,187,882.40

Abstract of 1903 tax rolls—Continued.

	Total, 1903.	Total, 1902.	Increase.	Decrease.
Agricultural lands and improvements	$5,183,918.00	$3,202,969.25	$1,980,948.75	
Grazing lands and improvements	5,892,030.00	6,778,506.35		$886,475.60
City lots and improvements	5,993,009.00	5,328,903.65	664,105.35	
Coal lands	60,055.00		60,055.00	
Timber lands	125,060.00		125,060.00	
Toll:				
Roads	3,400.00	4,000.00		600.00
Bridges	200.00	900.00		700.00
Telegraph and telephone lines	75,080.35	84,495.75		9,415.40
Irrigating ditches	17,318.00	12,112.00	5,206.00	
Reservoirs	11,320.00	60,660.00		49,340.00
Railroads:				
Narrow gauge	625,210.00	146,990.00	478,220.00	
Broad gauge	6,857,014.20	6,652,112.25	204,901.95	
Mines:				
Surface improvements	539,369.00	333,762.00	205,607.00	
Product	58,427.00	64,048.00		5,621.00
Mills	205,797.00	162,243.00	43,554.00	
Notes and book accounts	214,352.00	200,515.00	13,837.00	
Engines	190,929.00	36,499.00	154,430.00	
Horses	903,034.50	784,716.00	118,318.50	
Mules	102,627.00	72,343.00	30,284.00	
Cattle	6,432,955.00	6,180,430.00	252,525.00	
Sheep	2,727,977.50	2,412,403.00	315,574.50	
Goats	194,442.00	138,001.00	56,441.00	
Swine	16,187.00	12,766.75	3,420.25	
Burros	8,785.00	7,751.50	1,033.50	
Carriages and wagons	317,607.00	231,159.00	86,448.00	
Sewing machines	58,089.00	46,406.00	11,683.00	
Saddles and harness	115,694.00	92,933.00	22,761.00	
Merchandise	2,032,025.00	1,701,942.75	330,082.25	
Capital in manufacturing	13,067.00	14,835.00		1,768.00
Farm implements	88,125.25	73,988.75	14,136.50	
Saloon and office fixtures	124,161.00	92,453.54	31,707.46	
Money	286,204.97	145,947.70	90,257.27	
Bonds and warrants	15,656.00	15,869.20		213.20
Watches and clocks	27,388.00	21,003.20	6,384.80	
Books	37,693.00	27,363.00	10,330.00	
Jewelry	21,578.00	15,335.00	6,243.00	
Gold and silver plate	5,613.00	685.00	4,928.00	
Musical instruments	87,586.50	60,469.00	27,117.50	
Household goods	616,981.00	455,502.00	161,479.00	
Shares in banks	503,384.00	675,220.00		171,836.00
Wheat	194.00	2,908.00		2,714.00
Corn and barley	2,526.00	3,144.00		618.00
Hay	5,381.00	5,478.00		97.00
Wool		2,200.00		2,200.00
Lumber	83,117.00	70,820.00	12,297.00	
Coal	166.00	30.00	136.00	
Tools	45,552.00	21,161.00	24,391.00	
Bees	1,547.00	3,645.00		2,098.00
Other property not classified	954,733.77		4,651,119.43	3,696,385.66
Total valuation	41,832,566.79	41,108,745.07		
Exemptions	2,235,615.00	2,474,751.80		
Subject to taxation, 1903	39,596,951.79			
Subject to taxation, 1902		38,633,993.27		
Increase over 1902	3,900,312.88			
Decrease from 1902	2,937,354.36			
Net increase subject to taxation by counties	962,958.52			

Totals by classification:

1903	$39,596,951.79
1902	38,633,993.27
Net increase subject to taxation by classification	962,958.52

NOTE.—Counties Leonard Wood, Quay, Roosevelt, and Sandoval created by acts of thirty-fifth legislative assembly; Guadalupe County abolished.

Valuations for taxation purposes on different classes of property, 1903 tax rolls.

County.	Agricultural lands, per acre.	Grazing lands, per acre.	City or town lots, per lot.	Timber lands, per acre.	Coal lands, per acre.	Horses, per head.	Mules, per head.	Cattle, per head.	Sheep, per head.	Goats, per head.
Bernalillo	.....	$0.33	.....	.....	.....	$16.00	$22.42	$15.86	$1.00	$1.00
Chaves	$9.46	1.00	$33.40	.....	.....	12.39	30.08	11.22	1.42	.86
Colfax	5.00	.30	44.26	.....	.....	7.90	29.00	13.21	1.00	.....
Donna Ana	9.45	1.38	47.00	.....	.....	9.10	21.00	11.31	1.10	1.00
Eddy	7.07	.70	.....	.....	.....	8.64	23.52	11.05	1.49	1.64
Grant	10.74	1.02	.....	.....	.....	12.55	26.81	11.00	1.50	1.62
Luna	3.32	1.17	13.93	.....	.....	12.70	18.63	11.32	1.50	1.20
Lincoln	8.51	1.26	12.38	.....	.....	11.72	33.45	11.11	1.50	1.22
Leonard Wood	7.92	.96	.....	.....	.....	11.00	17.68	11.10	1.26	1.03
McKinley	1.64	.28	27.81	.....	$21.33	20.00	31.00	11.88	1.00	.....
Mora	4.45	.82	58.75	.....	.....	11.03	40.85	10.46	1.00	1.00
Otero	7.66	1.06	49.23	$5.09	.....	8.57	19.00	11.12	1.22	1.26
Quay	30.92	1.00	28.54	.....	.....	9.61	19.65	12.20	1.00	1.11
Rio Arriba	.....	.30	.....	.....	.....	14.65	19.14	13.56	1.00	.....
Roosevelt	.....	1.29	.....	.....	.....	4.79	42.32	11.19	1.50	.....
Sierra	5.45	.50	10.48	.....	.....	9.09	19.00	11.53	1.47	1.50
San Miguel	12.40	.46	66.90	.....	.....	12.25	22.20	12.17	1.50	1.00
Santa Fe	.....	.....	28.28	.....	.....	16.85	22.15	13.51	1.00	1.06
Socorro	10.00	.80	10.12	.....	.....	11.57	17.25	11.00	1.10	1.46
Sandoval	.....	.17	.....	.....	.....	13.62	18.28	12.12	1.00	1.00
San Juan	4.86	.....	29.20	.....	.....	20.69	26.01	13.13	1.15	1.35
Taos	7.14	.20	10.43	.....	.....	13.70	16.40	11.97	1.00	1.00
Union	1.02	.....	14.11	.....	.....	12.93	17.50	12.52	1.50	.....
Valencia	5.43	.67	.....	.....	.....	11.32	22.65	12.68	1.00	1.00

NOTE.—Abstracts accompanying rolls from certain counties fail to give total acreage, and therefore average value per acre can not be shown in such counties.

RAILROADS.

[Values fixed by Territorial board of equalization, January meeting, 1903.]

	Per mile.
Atchison, Topeka and Santa Fe:	
Track and rolling stock—	
Main line, from Albuquerque, passenger depot north	$7,000
Main line, south of Albuquerque to Rincon	6,500
Main line, Rincon to Deming	6,000
Main line, Rincon to Texas line	6,000
Silver City Branch	4,500
Whitewater Spur	2,500
Lake Valley Branch	3,000
Socorro and Magdalena Branch	3,250
Santa Fe Branch	3,500
All side tracks and switches	1,000
Colorado Southern:	
Track and rolling stock, main line	5,000
Side tracks and switches	1,000
Catskill Branch	2,000
Southern Pacific:	
Track and rolling stock, main line	7,000
Side tracks and switches	1,000
Santa Fe Pacific:	
Grazing lands, 25 cents per acre. Track and rolling stock, as fixed by act of Congress. Approved June 27, 1902 (see chap. 18, Laws of 1901), fixing amount of tax to be paid at $175 per mile for each mile of main track.	
Denver and Rio Grande:	
Main track, right of way, and rolling stock	3,000
Burns-Biggs Lumber Company Branch	500
Side track and switches	800

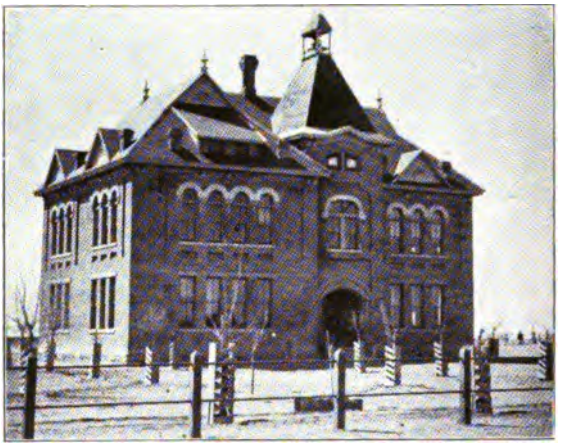
TELEGRAPH AND TELEPHONE LINES.

Twenty-five dollars per mile for lines carrying one wire and $5 additional per mile for each additional wire.

Telephone lines.—Ten dollars for each telephone instrument up to and including 50 instruments and $6 for each additional instrument. Lines extending beyond the limits wherein the central office is located, $15 per mile for first wire; $5 additional per mile for each additional mile outside of said localities.

National and other banking stocks at 6 per cent of par value.

PUBLIC SCHOOL BUILDING AT EAST LAS VEGAS.



HIGH SCHOOL BUILDING AT DEMING.

FIRST WARD SCHOOL AT SOCORRO.

REPORT OF SUPERINTENDENT OF PUBLIC INSTRUCTION.

SANTA FE, N. MEX., *September 9, 1903.*

SIR: In compliance with your request, I have the honor to submit herewith a report as to the condition of the public schools of New Mexico on August 1, 1903. This report covers only the public schools and does not include the higher educational institutions or private schools, the figures for which not being available at present no reports on the same are on file in this office.

School population August 1, 1903	68,152
(An increase in ten months of 6,363.)	
Enrollment of pupils	37,646
(An increase in ten months of 4,034.)	
Average daily attendance	24,856
(An increase in ten months of 2,283.)	
Number of public schools	665
(An increase in ten months of 62.)	
Number of teachers	757
(An increase in ten months of 45.)	
Receipts from all sources	$454,342.38
(An increase in ten months of $29,976.96.)	
Expenditures	$287,545.02
(A decrease in ten months of $37,239.89.)	
On hand August 1, 1903	$166,797.36
Value of public school property	$690,697.91

Speaking from the reports of county superintendents, instructors at teachers' institutes, citizens interested in education, and from my own personal observation, I have no hesitation in saying that the public schools of this Territory were never in a more flourishing condition. That the people readily and cheerfully respond in their contributions to the school fund under a taxation that might evoke murmurs from residents of Eastern States is evidenced by the figures above set forth. With a balance of $166,797.36 on hand at the commencement of schools on September 7, and with no bonded indebtedness in any school district, so far as this office is advised, the outlook for a successful year in the educational line is bright and one upon which the people of the Territory can congratulate themselves.

From the reports now at hand it appears that the teachers' normal institutes held throughout the Territory during the month of August have been generally successful, great interest being manifested and the attendance being large—necessarily so, as our law provides that no person shall teach in the public schools unless he or she can produce a certificate of attendance on some normal institute or summer school.

Examinations of applicants for teachers' certificates were held in every county of the Territory on August 28, and from the returns, as yet incomplete, a high degree of scholarship was exhibited, few failures being recorded.

Since the date of my last report four new counties have been created by acts of the legislative assembly of 1903. Superintendents of public schools appointed to office in these new counties, while exhibiting the utmost zeal in the discharge of their duties, have not as yet made such complete returns to this office as is desirable. From the new county of Leonard Wood, for instance, no report whatever has been received by this office, probably owing to the fact that the apportionment of the school funds to which this new county is entitled from the school fund of the old county of Guadalupe (now abolished) has not been satisfactorily and definitely made, so far as the various school districts are concerned; but I am advised unofficially that there is ample money in the school fund of each of the new counties to successfully maintain all schools during the coming school year. The amount of the school fund in these new counties I am unable to state, but whatever it may be should be added to the $166,797.36 now reported as being on hand and available for school purposes. A conservative estimate of the amount on hand available for

school purposes in these new counties would be $20,000. In my annual report which I am to submit at the close of the present year the exact figures in regard to the condition of the public schools in the new counties will appear, and I venture to say that my estimate as given above will be exceeded. Allowance must also be made for these new superintendents for their failure to make detailed reports on or before August 15, as required by law, because of the difficulties they must have encountered, and which undoubtedly they are now encountering, in obtaining statistics relative to their schools; but when matters have been brought down to a business basis I expect to receive reports from them of a most satisfactory character. Misapprehension as to the date when reports should be filed has caused delay in the filing of reports in this office, many county superintendents not realizing that by act of the last legislature reports were to be made at an earlier date than heretofore.

Regretting that I have not the data at hand from which to compile a further report as to other schools in the Territory, I have the honor to be,

Your most obedient servant,

J. FRANCO. CHAVEZ,
Superintendent of Public Instruction.

Hon. MIGUEL A. OTERO,
Governor of New Mexico.

NOTE.—During the last legislature the law was changed in regard to time for counties and school districts making reports until the month of August, so it was impossible for the superintendent of public instruction to secure reports up to June 30 that would contain the desired information. For this reason it was deemed best to insert the report as presented by the superintendent as above, under date of September 9, 1903.

REPORT OF THE SOLICITOR-GENERAL.

By EDWARD L. BARTLETT.

During the eleven months ending June 19, 1903, at the request of different Territorial officers, boards, and commissions, I have given 20 written opinions upon the construction of the laws relating to their different duties and functions, besides writing a large number of official letters, giving advice and directions to public officers and boards on the construction of laws, in reply to requests from them for information.

I have examined and passed upon a large number of requisition papers from other States and Territories, and have examined and given opinions as to the regularity of all applications to yourself for the issuance of requisition and extradition papers to other States, Territories, and the Republic of Mexico. I have allowed the name of the Territory to be used in three quo warranto proceedings upon proper showing to me that such writs would issue, and in one case declined to apply for the writ, for the reason that the showing made did not warrant me in asking the same. The party applying for this writ then applied to the district court of Santa Fe County directly for the writ or an order upon me in the nature of a mandamus to compel me to apply for the same. I appeared before the court. The matter was exhaustively argued, and the opinion of the court sustained my position and held that it had no jurisdiction to compel me to act.

I furnished the form for refunding bonds authorized by the last legislature and approved the deed and title of lands to the Deaf and Dumb Asylum and to the Reform School.

Under a law passed by the last legislative assembly the board of regents of the Agricultural College procured an alternative writ of mandamus against the treasurer of the Territory to compel him to place in the "temporary provisional indebtedness fund," for the benefit of the college, $25,000, appropriated to it by the act out of the "capitol building bond fund" and the "provisional indebtedness bond fund." I have filed a return to this writ, setting out reasons why it could not be complied with, and the matter will be heard before the court at chambers on the 29th instant.

In the matter of my intervention for the Territory in the "Elephant Butte Dam case," referred to in my last report, I would report that on January 22 last my petition to intervene on behalf of the Territory was denied by Judge Parker and the case is still pending in his court with the original parties, but is not being pressed by the Government.

There was only one criminal case appealed to the last term of the supreme court, which was dismissed by the appellant, and a writ of error in the same case issued under the extraordinary law of 1901, which, I regret to say, is still in force, although an effort was made to repeal the same by the last legislature.

Since the date of my last report eight judgments for the Territory have been affirmed, two reversed, and three are still under advisement by the court. One of these is the case of McLean & Co. *v.* The Territory, involving the constitutionality of the hide-inspection law passed by the legislature of 1901, and there are now no cases pending in the supreme court in which the Territory is interested except those under advisement.

I have served as a member of the United States commission to select lands for the Territory under the act of Congress of June 21, 1898, as a member of the Territorial board of public lands to sell and lease for the benefit of the Territory the lands thus selected, and as a member of the capitol custodian committee, each of which has held a regular monthly meeting and numerous special meetings.

I again earnestly renew the recommendation made by me in my last two reports, that Congress enact a law providing the time within which acts of the Territorial legislature should take effect. Under the present law, unless otherwise provided in the act, all new laws take effect thirty days after their passage. But the custom of the legislature for many years past has been to provide "that this act shall take

effect and be in force from and after its passage." This practice works a great hardship and injustice on our people on account of the sparse population, great area of territory, and lack of rapid means of communication, as well as delay in the publication of the laws. The last legislature passed 122 acts, all but a few of which were to take effect immediately.

The legislature adjourned on the 19th of March, and the laws are not printed and ready for distribution at this date. And during that time a term of court has been held in every county in the Territory, at which neither judges, attorneys, nor litigants were informed of the laws in force, what had been repealed or amended, or what new ones had been enacted. And I would earnestly recommend that no new act of the legislature should be in force until thirty days after its publication by the secretary of the Territory. Congress ought to provide for distributing the acts of Congress to the different Territorial officials, as many of these acts affect directly the conduct of business in the Territory and are necessary to be known in order to comply with them, and at present even our judges are not supplied.

REPORT OF THE COMMISSIONER OF PUBLIC LANDS.

By ALPHEUS A. KEEN.

Leases of common school lands approved by honorable Secretary of the Interior since January 1, 1903.

County.	Number of leases.	Amount of rental.
Bernalillo	1	$12.80
Chaves	64	1,044 80
Colfax	5	64 00
Donna Ana	8	124 80
Eddy	10	179 20
Grant	85	1,293.50
Guadalupe	48	704.40
Lincoln	4	51.20
Luna	4	158.60
Mora	5	64.00
Otero	8	175.00
Roosevelt	2	25.60
San Miguel	5	83.20
Santa Fe	1	12.80
Sierra	4	70.40
Socorro	10	147.20
Union	19	262.40
Valencia	5	166.40
Total	283	4,685.80

Number of leases of common school lands on file in the Department of the Interior awaiting approval of the honorable Secretary of the Interior, 81, representing a rental of $1,213.60. Number of applications awarded, leases not yet completed by applicants, 11, representing a rental of $211.20.

Five per cent of the proceeds of the sale of public lands within the territory of the United States are to be used as a permanent fund, the interest of which only shall be expended for the support of the common schools within the Territory. Section 4, act of Congress approved June 21, 1898 (Stat. 484). March 23, 1903, received from the United States, $2,026.26.

Apportionment common school income fund, by Hon. J. Francisco Chaves, superintendent of public instruction, May 7, 1903.

In accordance with the provisions of section 29, Chapter LXXIV, Laws of 1899, the following apportionment of funds now in the hands of the Territorial treasurer was made to the various counties of the Territory according to the pro rata enumeration of school children in each county as last returned from the county superintendent:

County.	Number of children of school age.	Apportionment.
Bernalillo	6,167	$2,159.45
Chaves	1,213	424.55
Colfax	3,087	1,080.45
Donna Ana	3,851	1,347.85
Eddy	1,231	430.50
Grant	2,988	1,045.80
Lincoln	1,986	695.10
Leonard Wood	1,431	500.55
Luna	779	272.65

County.	Number of children of school age.	Apportionment.
McKinley	693	$242.55
Mora	4,005	1,401.75
Otero	2,089	731.15
Quay	567	198.95
Roosevelt	712	249.20
Rio Arriba	3,618	1,266.30
San Juan	1,346	471.10
San Miguel	5,605	1,961.75
Santa Fe	5,862	2,051.70
Sandoval	2,618	916.30
Sierra	1,124	393.40
Socorro	2,701	945.35
Taos	3,731	1,305.85
Union	1,751	612.85
Valencia	3,347	1,171.45
Total	62,501	21,874.55

Institutional land sales for the six months ending June 30, 1903.

Name.	Acreage.	Amount.
Agricultural College	1,354.24	$4,082.72
Normal schools	2,720	12,240.00
Reform School	2,363.20	10,634.40
School of Mines	320	1,440.00
Penitentiary	1,280.08	4,800.26
Institute for the Blind	2,487.44	10,104.84
Deaf and Dumb Asylum	600	2,700.00
Miners' Hospital	2,240	9,120.00
Military Institute	1,760	6,480.00
Total	15,124.96	61,582.32

Institutional land leases for the six months ending June 30, 1903.

Name.	Leases.	Amount.
Insane Asylum	3	$46.40
Miners' Hospital	1	32.00
Total	4	78.40

The historical building known as "The Palace," in the city of Santa Fe, and lands connected therewith.

RECEIPTS.

January 1, 1903, cash on hand	$1,128.34
N. B. Laughlin, 3 months' rent	39.00
Paul A. F. Walter, P. M., 6 months' rent	300.00
Total	1,467.34

DISBURSEMENTS.

By transfers to Territorial treasurer, as shown by his official receipts on file. $1,467.34

Commissioner's office expense as evidenced by receipted vouchers on file showing itemized expenditures.

Stationery, advertising, telegrams, printing annual report 1902	$345.84
Government stamped envelopes, postage, and post-office box rent	73.58
Clerical assistance	125.05
Commissioner's salary	416.65
Total	961.12

Moneys deposited with the Territorial treasurer by the Commissioner of Public Lands, as shown by his official receipts on file.

1903.			
Mar. 10.	Common school income fund	$619.46	
	Normal school, Silver City, permanent fund	6,066.60	
	Normal school, Las Vegas, permanent fund	6,066.60	
	School of mines permanent fund	1,386.60	
	Reform school permanent fund	10,581.00	
	Blind asylum permanent fund	7,874.16	
	Deaf and dumb asylum permanent fund	2,646.60	
	Penitentiary permanent fund	2,826.96	
			$38,067.98
31.	Common school income fund	2,149.90	
	The Palace income fund	150.00	
	Miners' hospital income fund	32.00	
	Insane asylum income fund	30.80	
			2,362.70
31.	The Palace income fund, balance December 31, 1902	1,128.34	
	Territorial tax levy fund, balance December 31, 1902	2,139.78	
			3,268.12
Apr. 28.	Five per cent proceeds United States Land Office sales permanent fund		2,026.26
30.	Common school income fund	$736.65	
	The Palace income fund	39.00	
			775.65
June 1.	Common school income fund	166.40	
	Military institute permanent fund	480.00	
	The Palace income fund	100.00	
			746.40
9.	Agricultural college permanent fund	4,062.72	
	Military institute permanent fund	2,400.00	
	Blind asylum permanent fund	2,177.28	
	Miners' hospital permanent fund	1,920.00	
	Penitentiary permanent fund	1,920.00	
			12,480.00
July 17.	Common school income fund	1,243.40	
	The Palace income fund	50.00	
	Insane asylum income fund	15.60	
			1,309.00
23.	Military institute	3,546.62	
	Miners' hospital	7,146.62	
			10,693.24
			71,729.35

RECAPITULATION.

Common school income fund	$4,915.81	
Miners' hospital income fund	32.00	
Insane asylum income fund	46.40	
The Palace income fund	1,467.34	
Agricultural college permanent fund	4,062.72	
Miners' hospital permanent fund	9,066.62	
Military institute permanent fund	6,426.62	
Deaf and dumb asylum permanent fund	2,646.60	
Reform school permanent fund	10,581.00	
Penitentiary permanent fund	4,746.96	
Blind asylum permanent fund	10,051.44	
School of mines permanent fund	1,386.60	
Normal school, Silver City, permanent fund	6,066.60	
Normal school, Las Vegas, permanent fund	6,066.60	
Five per cent proceeds United States Land Office sales, account common school permanent fund	2,026.26	
Territorial tax levy fund to reimburse board of public lands, account United States Land Office fees balance December 31, 1902	2,139.78	
		71,729.35

Receipts:		Disbursements:	
Leases of common school lands approved by the honorable Secretary of the Interior	$4,635.30	Territorial treasurer	$71,729.35
Leases on file in Department of the Interior awaiting approval	1,213.60	Commissioner's office, expense	961.12
Incomplete applications	211.20	Cash on hand in banks	1,424.80
The Palace building	1,467.34		
Five per cent proceeds sales public lands within the Territory by the United States	2,026.26		
Institutional land sales	61,582.32		
Institutional land leases	78.40		
Deferred payment notes, series 1902, 1903, 1904, 1905	504.80		
Interest	6.67		
Additional payments on approved applications	249.60		
Territorial tax levy, balance December 31, 1902	2,139.78		
	74,115.27		74,115.27

REPORT OF THE TERRITORIAL LIBRARIAN.

By L. EMMETT.

The library occupies rooms set apart for it in two places in the capitol building, one on the second floor and the other in the basement thereof. The law library, consisting of the reports of the courts of last resort of all the States and Territories and of the United States courts, and of digests and statutes of the United States, the different States and Territories, is located on the east side of the building, on the second floor. It is a nice, well-lighted room, and well adapted to the use to which it is put, being easy of access from the supreme court room. There is shelf room now provided for about 8,000 volumes. The present number of books now stored in the law library aggregates 5,700 volumes. The average annual increase, by way of purchase and exchange, of this library is about 200. A few States, namely, New Hampshire, North Carolina, and Louisiana, have scarcely any reports. When filled out, these alone will add over 250 volumes, which would make, if all reports were complete, about 5,950 volumes. With the estimated average yearly increase there is now provided sufficient room for about six years to come. But on account of the variance of increase in the case of the different reports and the impracticability of a different arrangement, some reports will fill out their allotted space much sooner, so that they will be crowded for room within three years. Other sets of books should be purchased in the near future, and that will all the more necessitate an increase of shelf room. This could be done by extending the cases three shelves higher, which would add nearly one-half to the present space and would accommodate fully 4,000 more books.

This library is made a United States depository for its publications, which are stored, along with State publications, in the basement annex. The annex is made the repository for books of all description which do not fall within the class of books stored and belonging to the law library. A close estimate of the number of books stored there is 3,075 Federal publications and 1,975 State publications, making a total of 5,050 books in the annex. There is a yearly average increase of over 200 books in that department. But here the available space will not accommodate for more than two years the books which should be shelved there. By that time perhaps the legislature will see fit to provide additional room as above suggested, by putting up more shelves in the main library. In that case many of the important reports, such as those of United States Geological Survey, Bureau of Labor, American Historical Association, etc., can be stored in the main library, and in that way so relieve the annex as to furnish enough room for three or four years after that. So, all in all, room can be provided in the present quarters for the books that will be received for about six years more. By that time surely there will be a necessity for other quarters.

Another source of supply not mentioned above is the publication of the New Mexico Reports. By custom and agreement the Territory purchases 300 copies, and the board of trustees buys 100 copies, making 400 copies of every volume published. As there is no provision made for their disposal except by exchange with about sixty libraries, and as the reports come out at the rate of about a volume a year, the period of usefulness of the present quarters will be greatly diminished.

By constructing window lights in the outside walls of the foundation the non-available room in the basement could be utilized, and this might do away with the necessity of another structure.

A catalogue of all the books, both law and otherwise, is in preparation and is expected to be soon ready for the printer. On account of the small space allotted to the use of the library, it has been impossible to arrange the books as systematically and to classify them as thoroughly as might be desired, but it is hoped by means of this catalogue to make all the books accessible to the patrons of the library and to aid in the proper care and account of the books received hereafter. When better facilities are provided it is expected that a better classification and catalogue will be made.

Total number of books now on hand.

Law library	5,700
Estimated Federal documents, etc	3,075
Estimated State publications	1,975
Total	10,750

Estimated increase for fiscal year.

Law books by exchange	105
Purchased from publisher et al	230
Federal and State publications by exchange	200
Total increase for year ending June 30, 1903	535

REPORT OF THE TERRITORIAL FISH AND GAME WARDEN.

By PAGE B. OTERO.

Under section 3 of the new law I have so far made 47 appointments as deputy game and fish wardens for the Territory. These appointments have been distributed in the different counties as follows, viz: Santa Fe County, 11; Colfax County, 9; Mora County, 2; San Miguel County, 5; Bernalillo County, 2; Sandoval County, 2; San Juan County, 2; Chaves County, 1; Eddy County, 1; Socorro County, 3; Valencia County, 1; Rio Arriba County, 1; Taos County, 4; Grant County, 1; Sierra County, 1; Dofia Ana County, 1.

In this number are included the forest rangers in the different reserves, namely, 7 in the Gila Reserve, 4 in the Pecos Reserve, and 1 in the Lincoln Reserve.

I have visited nearly every section of the Territory, excepting those in the most southern counties, where I have been prevented from going by reason of heavy rains and floods, and I find that the old law has been constantly violated, and with impunity, due no doubt to the fact that there have been no means of enforcing the same and no one at the head to look after it.

I find also in almost every instance in the districts I have visited a disposition among the residents to obey the laws and to assist me in whatever way they can, since they realize what it means to them, and right here I may state that it is not the native residents who wantonly destroy the game and fish, but the professional hunter and visitors who desire to make records.

While the conditions regarding game and fish will no doubt improve under the present laws and the strict enforcement thereof, I would like to make a suggestion or two:

Outside of the game animals and birds, such as deer, elk, antelope, mountain sheep, wild turkey, mountain grouse, and quail killed illegally by hunters, not less than 30 per cent of the increase is lost through the ravages of bear, mountain lion, wolf, coyote, lynx, etc. There is only one way in which this destruction can be stopped, or at least lessened, and that is by increasing the bounty on such carnivorous animals.

The different tribes of Indians also have their animal hunts, in which they slaughter deer, antelope, and elk regardless of age and sex, and usually for the skins of the animals only, leaving the carcasses to rot or furnish food for wild beasts.

As far as I am at present able to learn, there are three small herds of elk still ranging within the limits of the Territory—one in Taos County, one in Colfax County, and another in Socorro County, in all not more than 100 in number.

There are also a few mountain sheep, some in the Guadalupe Mountains, some in the San Andres Range, and a few in Taos and San Juan counties. These animals, together with antelopes, once so plentiful, now scarce, should be protected for at least the next ten years.

The season on wild turkey, mountain grouse, and quail should also be shortened, that on quail particularly, and I see no reason why we should not have a closed season on turtle doves.

As there are no convenient means for keeping our streams and lakes stocked with game food fish, the conditions of this attractive sport are very bad. Streams like the Pecos, Mora, Cebolla, San Anton, Brazos, Chama, and many others, which a few years ago furnished magnificent sport, are now almost cleaned of trout. Through the efforts of Hon. Neill B. Field, Hon. W. B. Childers, and others interested, the Pecos River, a beautiful trout stream, has been occasionally stocked and now contains five varieties of trout, native mountain trout, eastern brook, rainbow, German brown, and dolly varden.

Sections 6 and 11 of the present law prohibiting the sale of game animals or fish killed or caught within the limits of the Territory will doubtless save a large percentage of both.

Reports from deputies give the gratifying information that upon official notification

all owners of canals, ditches, and acequias are complying with the law in placing wire screens, as required by section 8, at the intake of all such canals and ditches.

I am collecting all available data regarding conditions of streams in different districts in the Territory to show to the Department in Washington, with a view of inducing the United States Government to establish a fish hatchery at some convenient point in the Territory.

It has already been demonstrated that at Trout Springs, San Miguel County, owned by Mr. Max Nordhaus, of Las Vegas, N. Mex., trout can be hatched in from twenty-eight to forty days, and that all conditions—namely, temperature of water, amount of nourishment supply, and general natural surroundings—are perfect for establishing such a plant.

If this assistance can be secured, there will be no further difficulty in always keeping the streams plentifully supplied with game fish.

Quite a great deal of activity is being displayed by the Adams and Bartlett cattle companies and the Maxwell land grant owners in stocking their ranges and streams, the former companies having introduced Chinese pheasants and Bob White quail on their large ranches in Colfax County, and this year will place a large number of different varieties of trout in their streams.

The Silver City sportsmen have also shown great interest in protecting and preserving the game and fish in Grant, Sierra, and Socorro counties.

In April last I made a visit to Denver, Colo., for the purpose of consulting the State game and fish commissioner, Mr. J. M. Woodard, and was assured of his hearty cooperation in protecting the game and fish along the line between Colorado and New Mexico.

In conclusion I beg to state that while it has been and will continue to be difficult to secure the services of good men to act as deputy wardens, owing to the lack of sufficient inducements in the way of remuneration for loss of time in attending to these duties, still I have been very fortunate so far in enlisting a few such men, who are willing to waive all other considerations in their interest in protecting and preserving one of our most attractive features.

With such assistance, under the present laws I hope to be able ere my term of office expires to make a creditable showing.

In order to provide a fund for expenses of the office I would respectfully recommend as follows, viz:

That hunting and fishing licenses be issued, both resident and nonresident, for season or daily.

That a fee be charged for issuing importation certificates or permits to sell game or fish lawfully imported.

That all those taking advantage of the privilege under section 14 of the act shall pay a license.

That any person, association, or corporation maintaining any private preserve, pond, or lake pay license for same.

That taxidermists pay fees.

The Territory of New Mexico is far ahead of many States and Territories in natural advantages for the propagation of game animals and fish.

With its numerous mountain ranges, well supplied with timber and grass, furnishing food and shelter for its game animals, its never-failing supply of water, finding its way down the mountain sides in thousands of brooks and rivulets, homes of the beautiful trout, our Territory could be made a paradise for all who are interested in legitimate sport and care for healthy outdoor exercise.

REPORT OF THE ADJUTANT-GENERAL.

By W. H. WHITEMAN.

The aggregate strength of the Guard on June 30, 1903, is 398, made up by organizations stationed as follows, viz: Company A, Las Cruces; Company D, Silver City; Company F, Santa Fe; Company G, Albuquerque; Company H, Socorro; Company K, Las Vegas, of the First Regiment of infantry, headquarters, Albuquerque; Troop A of the First Squadron of cavalry, Las Vegas; the band of the First Regiment of infantry, at Albuquerque, and the band of the First Squadron of cavalry, at Santa Fe.

The men are well clothed with the blue regulation uniforms and are still armed with the Springfield rifles, but requisition has been made for the new United States magazine rifles, carbines, and accouterments, and it is hoped within a short time we will be prepared to issue the new arms. Requisitions have also been made for a complete equipment of blankets, tents, and camp equipage of every description, so that in a short time our companies will be completely equipped for field service. Preparation is being made to send the Guard about 250 strong to the joint maneuvers encampment to be held in Wyoming in the last half of August, and officers and men are greatly gratified that they will have an opportunity to learn something in addition to company drill. The improvement in efficiency and morale made since my last report is quite noticeable.

The several organizations of the Guard were inspected, under orders from the War Department, by Capt. Kirby Walker, Fourteenth U. S. Cavalry, beginning at Santa Fe May 18 and closing at Las Cruces May 22, 1903. There mustered at the inspections 325 officers and men, which did not include Company G, at Albuquerque, that company at that time being disorganized, discharges from various causes, principally from expiration of the term of service, having depleted the company to about 15 men. Since that time the organization of the company has been completed and now musters 45 officers and men. The inspections at Las Vegas and Silver City were made in daytime, which made it difficult for the men to get away from their business affairs and attend. However, the attendance at those places was, under the circumstances, very commendable. The report of the inspector has not been furnished this office.

Applications have been made for the organization of new companies at Deming and Portales, but being in doubt as to whether there were at these places a sufficient number of young men of eligible ages permanently residing there to maintain military organizations, no authorization has yet been given for the same. A new infantry company is talked of at Albuquerque, and a number of men have been enrolled. Great difficulty is experienced at the principal railroad towns in the Territory in organizing and keeping up military companies on account of the opposition of the various labor unions, which is so strong that at Albuquerque it was thought for a while that the reorganization of Company G would have to be abandoned, but fortunately the energy and persistence of the officers was sufficient to overcome the opposition. The greatest difficulty we have to encounter in maintaining the guard grows out of the transient character of our population. Young men come in from the States and soon join the guard at the place where they may locate, but soon become restless, and thinking they can do better elsewhere they move to some other place, so that the officers have to be continually recruiting their ranks, and for this reason we have at all times a large percentage of raw recruits in every company. Another great drawback is found in the insufficient appropriation made by the Territory for the support of the guard. In each company they are compelled to adopt a system of collecting monthly dues from each member to keep up their expenses. The small amount paid by the Territory for the rent of armories is the only help they receive from the Territory, which is but a small part of the expense of their maintenance.

The annual inspection required by law of the New Mexico Military Institute was made on the 21st day of March, 1903, and I am pleased to say that I found the con-

dition of that institution in admirable shape. The inspection was thorough and comprised an examination of the buildings, rooms, bedding, kitchen and dining department, the arms and accouterments, and I witnessed company and battalion drill. I made it a point to interrogate the students as to the treatment they received, and from all obtained the same answer—that they were entirely pleased with the institution and their instructors, that they had no complaints and wanted to return the next year. The superintendent, Col. J. W. Willson, and his corps of assistants seem to be men of ability and character and well fitted for their work. The school is growing in popular favor, as is shown by the large attendance, which now has an enrollment beyond the capacity of the buildings and a larger number than can be cared for properly. All sorts of shifts have to be made to accommodate the students. Temporary quarters are found for some in the building erected for a gymnasium and in the building erected for quarters for the officers. The necessity for additional buildings is so apparent, and has been presented by me so often, that it seems unnecessary to go over the matter at this time. The honor graduates in the class of 1903 were Bradley Morris Thomas, of Santa Fe, and Bruno Totzek, of Chaves County, who received commissions as second lieutenant in the National Guard as provided by law.

The official roster of the guard at this time is as follows, viz:

Hon. Miguel A. Otero, governor, commander in chief, Santa Fe; Brig. Gen. W. H. Whiteman, adjutant-general and ex officio quartermaster, commissary, and inspector-general, and chief of ordnance, Santa Fe; Col. W. R. Tipton, surgeon-general, Las Vegas; Col. W. H. H. Llewellyn, judge-advocate-general, Las Cruces; Col. William E. Dame, inspector of rifle practice, Albuquerque; Col. E. Godwin-Austen, aid-de-camp, Las Vegas; Col. E. W. Dobson, aid-de-camp, Albuquerque; Col. Venceslao Jaramillo, aid-de-camp, El Rito; Col. J. E. Hurley, aid-de-camp, Las Vegas; Col. A. S. Greig, aid-de-camp, Alamogordo; Col. J. W. Fleming, aid-de-camp, Silver City; Col. Jan Vanhouten, aid-de-camp, Raton; Col. J. W. Willson, aid-de-camp, Roswell.

FIRST REGIMENT OF INFANTRY, HEADQUARTERS ALBUQUERQUE.

Colonel, John Borrodaile, commanding, Albuquerque; lieutenant-colonel, Eugene Van Patten, Las Cruces; major, second battalion, J. E. Elder, Albuquerque; major third battalion, O. G. Myhre, Silver City; major-surgeon, J. F. Pearce, Albuquerque; adjutant, Capt. John H. Stingle, Albuquerque; quartermaster, Capt. E. W. Baltes, Albuquerque; commissary, Capt. W. C. Porterfield, Silver City; chaplain vacant; adjutant second battalion, First Lieut. O. A. Matson, Albuquerque; adjutant third battalion, First Lieut. J. R. Hicks, Silver City; quartermaster and commissary third battalion, First Lieut. W. F. Lorenz, Silver City; assistant surgeon, First Lieut. E. L. Woods, Silver City.

Company A, Las Cruces: Captain, John H. May, Las Cruces; first lieutenant, W. F. Jacoby, Las Cruces; second lieutenant, Theodore Rouault, Las Cruces.

Company D, Silver City: Captain, L. J. Newell, Silver City; first lieutenant, Colin Neblett, Silver City; second lieutenant, Charles B. Morrill, Silver City.

Company F, Santa Fe: Captain, John Shoemaker, Santa Fe; first lieutenant, Juan B. Sandoval, Santa Fe; second lieutenant, Henry Alarid, Santa Fe.

Company G, Albuquerque: Captain, Michael O'Donnell, Albuquerque; first lieutenant, Charles Whiting, Albuquerque; second lieutenant, Luebbo G. Albers, Albuquerque.

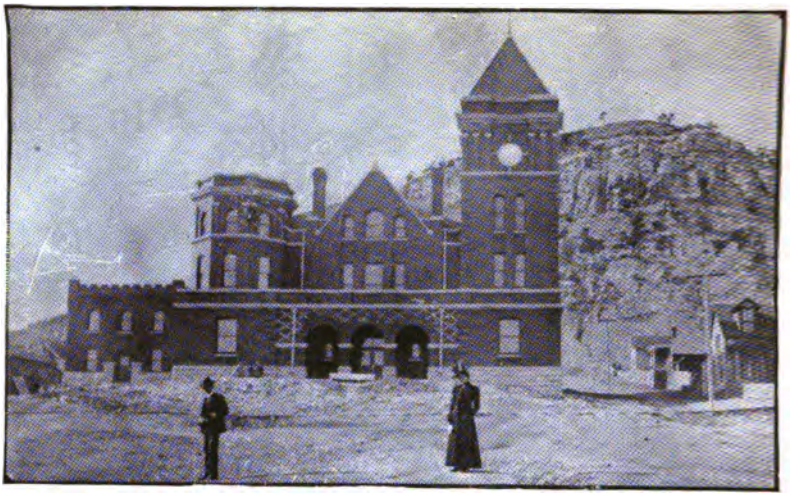
Company H, Socorro: Captain, T. J. Mathews, Socorro; first lieutenant, S. Abeytia, Socorro; second lieutenant, O. R. Smith, Socorro.

Company K, Las Vegas: Captain, A. R. DaCosta, Las Vegas; first lieutenant, B. Lucero, Las Vegas; second lieutenant, J. C. Lynch, Las Vegas.

FIRST SQUADRON CAVALRY, HEADQUARTERS LAS VEGAS.

Major, R. C. Rankin, Las Vegas; adjutant, First Lieut. R. H. Gross, Las Vegas; quartermaster and commissary, Second Lieut. R. C. Reid, Las Vegas; assistant surgeon, Capt. H. M. Smith, Las Vegas.

Troop A, Las Vegas: Captain, A. P. Tarkington, Las Vegas; first lieutenant, E. J. McWenie, Las Vegas; second lieutenant, Ludwig, W. Ilfeld, Las Vegas.



THE COURT-HOUSE AT RATON.

THE COURT-HOUSE AT SOCORRO.

THE COURT-HOUSE AT SILVER CITY.

REPORT OF THE COURTS.

THE SUPREME COURT.

By J. D. SENA, Clerk.

At the close of the fiscal year ending June 30, 1902, and the date of my last report to you, the docket of this court showed the following:

Cases under advisement	21
Cases pending on motion	1
Cases to be heard August 28, 1902	2
Cases for disbarment	1
Cases returnable to January term, 1903	10
Cases filed during the present fiscal year	43
Total	78

The cases above enumerated were brought into this court as follows:

	By appeal.	By writ of error.	Total.
First judicial district	7	2	9
Second judicial district	23	4	27
Third judicial district	7	3	10
Fourth judicial district	18	3	21
Fifth judicial district	9	.....	9
Original in Supreme Court (disbarment)	.....	.....	2
Total	.....	.....	78

Of which cases the following disposition is shown on the docket of this court, viz:

Finally determined by affirmance	21
Finally determined by dismissal	10
Reversed and remanded to the district courts	9
Under advisement by the court	31
Disbarment	2
Returnable January term, 1904	5
Total	78

Of the cases removed from this court to the Supreme Court of the United States it stands as follows:

Pending at the date of the last report	2
Appealed during the year	1
Total	3
Disposed of as follows:	
Reversed for further evidence	1
Still pending in Supreme Court	2
Total	3

The first day of each regular term of the supreme court is examination day for the admission of all applicants to the bar, and on the first day of the last January term there were 18 applications on file in this office, and all took the examination or were admitted on certificates of previous practice except one who did not appear.

Owing to the careful determination of cases in the lower courts by the judges in the different districts, the business of this court has been gradually diminishing.

FIRST JUDICIAL DISTRICT.

A. M. BERGERE, Clerk.

UNITED STATES.

CIVIL.

Causes pending July 1, 1902	2
Causes instituted from July 1, 1902, to June 30, 1903	1
Causes disposed of	1
Causes pending June 30, 1903	2

CRIMINAL.

Causes pending July 1, 1902	10
Causes instituted from July 1, 1902, to June 30, 1903	8
Causes disposed of by trial and judgment	8
Causes pending June 30, 1903	10

UNITED STATES BANKRUPTCY.

Causes pending July 1, 1902	3
Causes instituted from July 1, 1902, to June 30, 1903	1
Causes disposed of	0
Causes pending June 30, 1903	4

TERRITORIAL.

SANTA FE COUNTY.

CIVIL.

Causes pending July 1, 1902	117
Causes instituted from July 1, 1902, to June 30, 1903	167
Causes disposed of by dismissal	41
Causes disposed of by trial and judgment	70
Causes disposed of by change of venue	1
Causes pending June 30, 1903	162

CRIMINAL.

Causes pending July 1, 1902	43
Causes instituted from July 1, 1902, to June 30, 1903	36
Causes disposed of by dismissal	21
Causes disposed of by trial and plea	9
Causes disposed of by being dropped from docket	11
Causes disposed of by change of venue	1
Causes pending June 30, 1903	37

RIO ARRIBA COUNTY.

CIVIL.

Causes pending July 1, 1902	47
Causes instituted from July 1, 1902, to June 30, 1903	37
Causes disposed of by dismissal	20
Causes disposed of by trial and judgment	12
Causes pending June 30, 1903	52

CRIMINAL.

Causes pending July 1, 1902	24
Causes instituted from July 1, 1902, to June 30, 1903	38
Causes disposed of by dismissal	20
Causes disposed of by trial and plea	5
Causes disposed of by being dropped from docket	6
Causes pending June 30, 1903	31

TAOS COUNTY.

CIVIL.

Causes pending July 1, 1902	26
Causes instituted from July 1, 1902, to June 30, 1903	53
Causes disposed of by dismissal	13
Causes disposed of by trial and judgment	32
Causes pending June 30, 1903	34

CRIMINAL.

Causes pending July 1, 1902	9
Causes instituted from July 1, 1902, to June 30, 1903	18
Causes disposed of by dismissal	7
Causes disposed of by trial and plea	7
Causes disposed of by being dropped from docket	2
Causes disposed of by change of venue	1
Causes pending June 30, 1903	10

SAN JUAN COUNTY.

CIVIL.

Causes pending July 1, 1902	16
Causes instituted from July 1, 1902, to June 30, 1903	43
Causes disposed of by dismissal	5
Causes disposed of by trial and judgment	23
Causes pending June 30, 1903	21

CRIMINAL.

Causes pending July 1, 1902	13
Causes instituted from July 1, 1902, to June 30, 1903	15
Causes disposed of by dismissal	14
Causes disposed of by trial	2
Causes pending June 30, 1903	12

SUMMARY.

CIVIL.

Causes pending July 1, 1902:	
United States	2
Bankruptcy	3
Santa Fe County	117
Rio Arriba County	47
Taos County	26
San Juan County	16
Total	211
Causes filed from July 1, 1902, to June 30, 1903:	
United States	1
Bankruptcy	1
Santa Fe County	167
Rio Arriba County	37
Taos County	53
San Juan County	43
Total	302
Causes disposed of by dismissal:	
Santa Fe County	41
Rio Arriba County	20
Taos County	13
San Juan County	5
Total	79
Causes disposed of by trial and judgment:	
United States	1
Santa Fe County	70
Rio Arriba County	12
Taos County	32
San Juan County	23
Total	138
Causes disposed of by change of venue:	
Santa Fe County	1

Causes pending June 30, 1903:	
United States	2
Bankruptcy	4
Santa Fe County	162
Rio Arriba County	52
Taos County	34
San Juan County	21
Total	275

CRIMINAL.

Causes pending July 1, 1902:	
United States	10
Santa Fe County	43
Rio Arriba County	24
Taos County	9
San Juan County	13
Total	99
Causes instituted from July 1, 1902, to June 30, 1903:	
United States	8
Santa Fe County	36
Rio Arriba County	38
Taos County	18
San Juan County	15
Total	115
Causes disposed of by dismissal:	
Santa Fe County	21
Rio Arriba County	20
Taos County	7
San Juan County	14
Total	62
Causes disposed of by trial and judgment:	
United States	8
Santa Fe County	9
Rio Arriba County	5
Taos County	7
San Juan County	2
Total	31
Causes disposed of by being dropped from the docket:	
Santa Fe County	11
Rio Arriba County	6
Taos County	2
Total	19
Causes disposed of by change of venue:	
Santa Fe County	1
Taos County	1
Total	2
Causes pending June 30, 1903:	
United States	10
Santa Fe County	37
Rio Arriba County	31
Taos County	10
San Juan County	12
Total	100

RECAPITULATION.

CIVIL.

Causes of all kinds pending July 1, 1902	211
Causes of all kinds filed from July 1, 1902, to June 30, 1903	302
Total	513
Causes of all kinds disposed of	218
Causes of all kinds pending June 30, 1903	295
Total	513

CRIMINAL.

Causes pending July 1, 1902	99
Causes of all kinds filed from July 1, 1902, to June 30, 1903	115
Total	214
Causes of all kinds disposed of	114
Causes of all kinds pending June 30, 1903	100
Total	214

SECOND JUDICIAL DISTRICT.

By W. E. DAME, Clerk.

Cases of all kinds on dockets June 30, 1902	371	
Cases of all kinds instituted during year	446	
		817
Cases of all kinds disposed of during year		510
Balance, cases of all kinds on docket June 30, 1903		307

DISTRICT COURT, BERNALILLO COUNTY.

Criminal cases pending on docket June 30, 1902		22
Criminal cases instituted during year ending June 30, 1903		116
		138
Disposed of:		
Convictions	38	
Acquittals	22	
Dismissals	31	
		91
Balance, cases pending June 30, 1903		47
Civil actions pending June 30, 1902		243
Civil actions filed during year ending June 30, 1903		234
		477
Disposed of:		
Tried	255	
Dismissed	39	
		294
Balance, cases pending June 30, 1903		163

DISTRICT COURT, VALENCIA COUNTY.

Criminal cases pending on docket June 30, 1902	16
Criminal cases instituted during year ending June 30, 1903	21
	37

Disposed of:		
Convictions	3	
Acquittals	1	
Dismissals	3	
		7
Balance, cases pending June 30, 1903		30
Civil actions pending June 30, 1902		54
Civil actions instituted during year ending June 30, 1903		34
		88
Disposed of:		
Tried	45	
Dismissed	12	
		57
Balance, cases pending June 30, 1903		31

DISTRICT COURT, M'KINLEY COUNTY.

Civil actions pending June 30, 1902		12
Civil actions instituted during year ending June 30, 1903		41
		53
Disposed of:		
Tried	18	
Dismissals	5	
		23
Balance, cases pending June 30, 1903		30
Criminal cases pending on docket June 30, 1902		None.
Criminal cases instituted during year ending June 30, 1903		14
Disposed of:		
Convictions	6	
Dismissals	2	
		8
Balance, cases pending June 30, 1903		6

DISTRICT COURT, SANDOVAL COUNTY.

Civil actions pending June 30, 1902		None.
Civil actions instituted during year ending June 30, 1903		10

DISTRICT COURT (UNITED STATES), SECOND JUDICIAL DISTRICT.

Cases of all kinds on docket June 30, 1902	24	
Cases of all kinds instituted during year	21	
		45
Cases of all kinds disposed of during year		24
Balance, cases of all kinds on docket June 30, 1903		21
Criminal cases pending on docket June 30, 1902		6
Criminal cases instituted during year ending June 30, 1903		20
		26
Disposed of:		
Convictions	6	
Acquittals	5	
Dismissals	5	
		16
Balance, cases pending June 30, 1903		10
Civil actions pending June 30, 1902		18
Civil actions instituted during year ending June 30, 1903		1
		19

Disposed of:		
Tried	2	
Dismissed	6	
		8
Balance, cases pending June 30, 1903		11

THIRD JUDICIAL DISTRICT.

By J. P. MITCHELL, Clerk.

UNITED STATES.

CIVIL.

Cases pending June 30, 1902		10
Cases filed from July 1, 1902, to June 30, 1903		7
		17
Disposed of:		
By trial	4	
By court	2	
		6
Balance, pending June 30, 1903		11

CRIMINAL.

Cases pending June 30, 1902		11
Cases filed since July 1, 1902		8
		19
Disposed of:		
By dismissal	1	
By convictions	3	
		4
Balance, pending June 30, 1903		15

TERRITORIAL.

DOÑA ANA COUNTY.

CIVIL.

Cases pending June 30, 1902		20
Cases filed from July 1, 1902, to June 30, 1903		62
		82
Disposed of:		
Dismissals	15	
By trial	26	
		41
Balance, pending June 30, 1903		41

CRIMINAL.

Cases pending June 30, 1902		52
Cases filed from July 1, 1902, to June 30, 1903		51
		103
Disposed of:		
Change of venue	1	
Dropped with leave	13	
Dismissals	26	
Number of bills	23	
Convictions	3	
Acquittals	2	
		68
Balance, pending June 30, 1903		35

GRANT COUNTY.

CIVIL.

Cases pending June 30, 1902		77
Cases filed from July 1, 1902, to June 30, 1903		67
		144
Disposed of:		
By trial	53	
By dismissal	31	
		84
Balance, pending June 30, 1903		60

CHANCERY.

Cases pending June 30, 1902		10
Disposed of		2
Balance, pending June 30, 1903		8

CRIMINAL.

Cases pending June 30, 1902		42
Cases filed from June 30, 1902, to July 1, 1903		122
		164
Disposed of:		
Nolle	26	
Acquittals	6	
Dropped, with leave to reinstate	43	
Convictions	63	
No bills	9	
		147
Balance, pending June 30, 1903		17

SIERRA COUNTY.

CIVIL.

Cases pending June 30, 1902		5
Cases filed from June 30, 1902, to July 1, 1903		13
		18
Disposed of:		
By trial	5	
By dismissal	1	
		6
Balance, pending June 30, 1903		12

CRIMINAL.

Cases pending June 30, 1902		20
Cases filed from June 30, 1902, to July 1, 1903		25
		45
Disposed of:		
No bills	5	
Change of venue	1	
Dismissals	2	
Acquittals	2	
Convictions	1	
		11
Balance, pending June 30, 1903		34

OTERO COUNTY.

CIVIL.

Cases pending June 30, 1902		33
Cases filed from June 30, 1902, to June 30, 1903		54
		87

Disposed of:		
By trial	14	
By dismissal	5	
		19
Balance, pending June 30, 1903		68

CRIMINAL.

Cases pending June 30, 1902		30
Cases filed from June 30, 1902, to June 30, 1903		59
		89
Disposed of:		
Convictions	18	
Acquittals	5	
Dropped, with leave	1	
Dismissals	9	
No bills	14	
		47
Balance, pending June 30, 1903		42

LUNA COUNTY.

CIVIL.

Cases pending June 30, 1902		12
Cases filed from June 30, 1902, to June 30, 1903		23
		35
Disposed of:		
By trial	6	
Dismissal	3	
		9
Balance, cases pending June 30, 1903		26

CRIMINAL.

Cases pending June 30, 1902		30
Cases filed from June 30, 1902, to June 30, 1903		83
		113
Disposed of:		
Convictions	38	
Acquittals	2	
Dismissals	16	
Dropped, with leave	1	
Change of venue	3	
No bills	6	
		66
Balance, pending June 30, 1903		47

FOURTH JUDICIAL DISTRICT.

SECUNDINO ROMERO, Clerk.

GUADALUPE COUNTY (NOW LEONARD WOOD COUNTY).

CIVIL.

Pending June 30, 1902	30
New cases (since)	18
	48
Judgments rendered	9
Dismissed	3
Pending June 30, 1903	36
Total	48

CRIMINAL.

Pending June 30, 1902	74
Pending June 30, 1903	74

UNION COUNTY.

CIVIL.

Pending June 30, 1902	48
New cases (since)	47
	95
Judgments rendered	31
Dismissed	15
Stricken from docket	7
Pending June 30, 1903	42
Total	95

CRIMINAL.

Pending June 30, 1902	28
New indictments (since)	60
	88
Convictions	24
Acquittals	2
Dismissed	24
Stricken from docket	13
No true bills	3
Pending June 30, 1903	22
Total	88

MORA COUNTY.

CIVIL.

Pending June 30, 1902	58
New cases (since)	39
	97
Judgments rendered	18
Dismissed	4
Stricken from docket	11
Pending June 30, 1903	64
Total	97

CRIMINAL.

Pending June 30, 1902	36
New indictments (since)	15
	51
Convictions	2
Dismissed	22
Stricken from docket	2
Venue changed	1
No true bills	2
Pending June 30, 1903	22
Total	51

COLFAX COUNTY.

CIVIL.

Pending June 30, 1902	101
New cases (since)	95
	196
Judgments rendered	67
Dismissed	33
Stricken from docket	11
Pending June 30, 1903	85
Total	196

CRIMINAL.

Pending June 30, 1902	47
New indictments (since)	95
	142
Convictions	25
Acquittals	1
Dismissed	37
Stricken from docket	23
No true bills	1
Pending June 30, 1903	55
Total	142

SAN MIGUEL COUNTY.

CIVIL.

Pending June 30, 1902	250
New cases (since)	151
	401
Judgments rendered	115
Dismissed	42
Stricken from docket	27
Venue changed	1
Pending June 30, 1903	216
Total	401

CRIMINAL.

Pending June 30, 1902	61
New indictments (since)	55
Total	116
Convictions	21
Dismissed	34
Stricken from docket	6
Pending June 30, 1903	55
Total	116

QUAY COUNTY.

CIVIL.

Pending June 30, 1902	None.
New cases (since)	4
Judgments rendered	2
Pending June 30, 1903	2
Total	4

CIVIL CASES.

Pending June 30, 1902:	
Leonard Wood County (formerly Guadalupe County)	30
Union County	48
Mora County	58
Colfax County	101
San Miguel County	250
Total	487
New cases (since):	
Leonard Wood County (formerly Guadalupe County)	18
Union County	47
Mora County	39
Colfax County	95
San Miguel County	151
Quay County	4
Total	354
Judgments rendered:	
Leonard Wood County (formerly Guadalupe County)	9
Union County	31
Mora County	18
Colfax County	67
San Miguel County	115
Quay County	2
Total	242
Dismissals:	
Leonard Wood County (formerly Guadalupe County)	3
Union County	15
Mora County	4
Colfax County	33
San Miguel County	42
Total	97
Stricken from docket:	
Leonard Wood County (formerly Guadalupe County)	None.
Union County	7
Mora County	11
Colfax County	11
San Miguel County	27
Total	56
Venue changed:	
San Miguel County	1
Pending June 30, 1903:	
Leonard Wood County (formerly Guadalupe County)	36
Union County	42
Mora County	64
Colfax County	85
San Miguel County	216
Quay County	2
Total	445

CRIMINAL CASES.

Pending June 30, 1902:	
Leonard Wood County (formerly Guadalupe County)	74
Union County	28
Mora County	36
Colfax County	47
San Miguel County	61
Total	246

New indictments (since):	
Leonard Wood County (formerly Guadalupe County)	None.
Union County	60
Mora County	15
Colfax County	95
San Miguel County	55
Total	225
Convictions:	
Union County	24
Mora County	2
Colfax County	25
San Miguel County	21
Total	72
Acquittals:	
Union County	2
Colfax County	1
Total	3
Dismissals:	
Union County	24
Mora County	22
Colfax County	37
San Miguel County	34
Total	117
Stricken from docket:	
Union County	13
Mora County	2
Colfax County	23
San Miguel County	6
Total	44
Venue changed:	
Mora County	1
Number of true bills:	
Union County	3
Mora County	2
Colfax County	1
Total	6
Pending June 30, 1903:	
Leonard Wood County (formerly Guadalupe County)	74
Union County	22
Mora County	22
Colfax County	55
San Miguel County	55
Total	228

SUMMARY.

CIVIL CASES.

Pending June 30, 1902	487
New cases (since)	354
Total	841

Judgments rendered	242
Dismissals	97
Stricken from docket	56
Venue changed	1
Pending June 30, 1903	445
Total	841

CRIMINAL CASES.

Pending June 30, 1902	246
New indictments (since)	225
Total	471
Convictions	72
Acquittals	3
Dismissals	117
Stricken from docket	44
Venue changed	1
No true bills	6
Pending June 30, 1903	228
Total	471

FIFTH JUDICIAL DISTRICT.

JOHN E. GRIFFITH, Clerk.

UNITED STATES BUSINESS.

CIVIL.

Causes pending July 1, 1902	11
Docketed from July 1, 1902, to June 30, 1903	8
Judgments during year	2
Causes pending June 30, 1903	13

CRIMINAL.

Causes pending July 1, 1902	11
Docketed during year	2
Pleas of guilty	2
Nolles	6
Pending June 30, 1903	4

SOCORRO COUNTY.

CIVIL.

Pending July 1, 1902	118
Docketed	44
Dismissals	11
Trials and judgments	38
Pending June 30, 1903	113

CRIMINAL.

Pending July 1, 1902	65
Docketed	5
Disposed of by judge as committing magistrate	1
Pending June 30, 1903	69

LINCOLN COUNTY.

CIVIL.

Pending July 1, 1902	64
Docketed	59
Tried before court and jury	26
Dismissed	3
Pending June 30, 1903	94

CRIMINAL.

Pending July 1, 1902	79
Docketed	21
Convictions	5
Acquittals	3
Nolles	13
Pending June 30, 1903	79

CHAVES COUNTY.

CIVIL.

Pending July 1, 1902	54
Docketed	93
Tried by court and jury	49
Dismissed	24
Pending June 30, 1903	74

CRIMINAL.

Pending July 1, 1902	38
Docketed	50
Convictions	4
Acquittals	1
Pleas of guilty	14
Nolles	22
Pending June 30, 1903	47

EDDY COUNTY.

CIVIL.

Pending July 1, 1902	29
Docketed	16
Tried by court and jury	14
Dismissed	2
Pending June 30, 1903	29

CRIMINAL.

Pending July 1, 1902	41
Docketed	20
Convictions	7
Acquittals	0
Dismissed	1
Pending June 30, 1903	53

RECAPITULATION.

Total cases pending July 1, 1902	510
Docketed during year	318
Disposed of during year	248
Pending during year	828
Pending June 30, 1903	580

My deputy in Roosevelt County is sick and made no report. That county was only recently organized. No court has been held there and no criminal business transacted, but some five or six civil cases have been docketed.

REPORTS OF THE DISTRICT ATTORNEYS.

SANTA FE, RIO ARRIBA, TAOS, AND SAN JUAN COUNTIES.

By E. C. ABBOTT.

SANTA FE COUNTY.

Cases pending July 1, 1902	43
Cases instituted July 1, 1902, to June 30, 1903	36
Cases disposed of by dismissal	21
Cases disposed of by trial and judgment	9
Cases dropped from docket	11
Cases disposed of by change of venue	1
Cases pending June 30, 1903	37

Nature of accusations of cases instituted from July 1, 1902, to June 30, 1903:

Appeals	6
Arson	1
Assaults	12
Carrying deadly weapons	3
Burglary	1
Embezzlement	4
Violation liquor law	2
Murder	7
Total	36

RIO ARRIBA COUNTY.

Cases pending July 1, 1902	24
Cases instituted from July 1, 1902, to June 30, 1903	38
Cases disposed of by dismissal	20
Cases disposed of by trial and plea	5
Cases disposed of by being dropped from the docket	6
Cases pending June 30, 1903	31

Nature of accusations of cases instituted from July 1, 1902, to June 30, 1903:

Appeal	11
Assaults	7
Carrying deadly weapons	2
Discharging pistol	1
Forgery	1
Grand larceny	7
Libel	1
Murder	3
Obtaining money under false pretenses	2
Perjury	1
Violation gaming laws	2
Total	38

TAOS COUNTY.

Cases pending July 1, 1902	9
Cases instituted from July 1, 1902, to June 30, 1903	18
Cases disposed of by dismissal	7
Cases disposed of by trial and plea	7
Cases dropped from docket	2
Cases disposed of by change of venue	1
Cases pending June 30, 1903	10

Nature of accusations of cases instituted from July 1, 1902, to June 30, 1903:

Assaults	7
Violation liquor laws	10
Grand larceny	1
Total	18

SAN JUAN COUNTY.

Cases pending July 1, 1902	13
Cases instituted from July 1, 1902, to July 30, 1903	15
Cases disposed of by dismissal	14
Cases disposed of by trial	2
Cases pending June 30, 1903	12

Nature of accusations of cases instituted from July 1, 1902, to June 30, 1903:

Appeal	1
Aiding prisoners to escape	2
Forgery	1
Grand larceny	6
Obtaining money by false pretenses	1
Unlawfully driving cattle	2
Rape	1
Unlawfully branding cattle	1
Total	15

The people residing in the counties of the first judicial district believe in law and order, and the grand and petit juries have cooperated with the officers of the courts in the rigid enforcement of the law.

One of the murders that was committed in Santa Fe County was committed by two prisoners who were not citizens of the Territory, and while detained in jail for other offenses murdered the jailor in an effort to escape. One of the murderers was hanged and the other was sentenced to life imprisonment.

Three of the counties of this district are border counties, and most of the crimes are committed by residents of the border States.

BERNALILLO, SANDOVAL, McKINLEY, AND VALENCIA COUNTIES.

By F. W. Clancy.

In Bernalillo County the criminal business is summarized as follows:

Cases pending June 30, 1902		26
New cases during year		91
		117
Disposed of:		
Dismissed or stricken from docket with leave to reinstate	30	
Convictions	38	
Acquittals	11	
Venue changed to other counties	4	
		82
Pending June 30, 1903		35

The 91 new cases are classified as follows:

Murder	3
Crimes against persons, felonies	16
Crimes against property, felonies	44
Crimes against public justice	16
Assault and battery	2
Crimes against revenue laws	1
Other minor offenses	9
Total	91

In Valencia County the criminal business is summarized as follows:

Pending June 30, 1902		7
New cases during year		21
		28
Disposed of:		
Dismissed or stricken from docket with leave to reinstate	5	
Convictions	3	
Venue changed to another county	3	
		11
Pending June 30, 1903		17

The 21 new cases are classified as follows:

Crimes against persons, felonies	4
Crimes against property, felonies	6
Assault and battery	3
Other minor offenses	8
Total	21

In McKinley County there has been but one term of court, which was held in July, 1902. The criminal business is as follows:

Cases during year		11
Disposed of:		
Dismissed	1	
Convictions	4	
Acquittals	1	
		6
Pending June 30, 1903		5

The 11 cases are classified as follows:

Murder	3
Crimes against persons, felonies	4
Assault and battery	1
Other minor offenses	3
Total	11

In Sandoval County no court has yet been held, so that there are no criminal cases regularly on the docket of that court. I may say, however, that the indications are that there will be but little criminal business in that county.

There is reason to believe that the next term of court in Valencia County will show a considerable increase in the number of criminal cases, which will be due principally to the coming into the county of a large number of outsiders, many from different parts of our own country and some from the Republic of Mexico, who were attracted by the railroad building from Belen to the eastward. Such railroad operations usually bring together a large number of hangers-on of the worst sort, and disorder, robbery, and violence become common. I am inclined to believe that there was much less of crime following along the construction of this line of railroad than has ordinarily been the case in other places, but still enough seriously to affect the previous good record of the county as to the amount of criminal business. It must not be forgotten, however, that this is due to the lawless character of strangers and is not to be considered as a fault of the ordinary population of the county.

I desire to call your attention to the very cumbersome and unsatisfactory operation of the present statutes with regard to the collection of delinquent taxes. It had been hoped that the recent legislature would amend the law, in view of experience since 1899, but as it failed to do so it may be well to speak of these things at this time in the hope that when another legislature meets there may have been such discussion of the subject as to prepare the way for needed changes.

I do not intend to make any minute criticism of the statute of 1899, although there are many matters of detail in which it could be improved. The general purpose of the statute was a good one, but in its practical workings it is quite clear that some of its provisions are not satisfactory. In the first place, there is an arbitrary division as to delinquent taxes into two classes—one of not more than $25 and the other of

greater amounts—and a different practice and method of dealing with the two classes are adopted. In a broad way, there can be no good reason for thus complicating and confusing this subject by having two such different systems in force. In the next place, it is required that in all cases where the delinquencies amount to more than $25 each the form of obtaining an omnibus judgment in the district court is to be resorted to. This results in a great number of controversies which are more or less perplexed and confused by their being mixed up under one general head when they ought to be kept separate. No more or better notice is given to this class of delinquent taxpayers than to the small ones, and it is difficult to see any reason why it would not be sufficient to authorize the collector of taxes, after having published the list of delinquents, to proceed to make sales in all cases without resorting to the district court at all, except in those cases where there may exist some special reasons for having suits brought against the delinquents, but which should be brought, as is now provided, only upon an order of the district court authorizing the bringing of separate suits. If the law could be changed in this regard, it would greatly relieve the files and records of the district court and would tend to much greater clearness and regularity of judicial proceedings in tax matters.

It may not be improper at this time to commend the action of the legislature in creating the office of traveling auditor. I am satisfied that the conduct of business in every county in New Mexico will be greatly improved by the exertions of this officer and that the Territorial treasury will be benefited by actual increased receipts of money, enormously exceeding all that the office can possibly cost. Perhaps these benefits are to be attributed more to the ability and industry of the man who holds the office than to the character of the statute itself, but no law can be entirely self-executing. Our legislators deserve none the less of credit because an unusually able man has been intrusted with the performance of duties prescribed by a statute.

SAN MIGUEL, LEONARD WOOD, MORA, AND QUAY COUNTIES.

By S. B. Davis, Jr.

No court has been held in the former county of Guadalupe since the October term, 1901; and, therefore, the annexed statement shows nothing as to that county except cases pending. The county was divided by the last legislature, and some of the cases pending therein will be tried at Santa Rosa, the county seat of the new county of Leonard Wood, and the remainder at Tucumcari, the county seat of the new county of Quay.

Court will be held at Santa Rosa next October, and at that tine a large portion of the cases now pending in the old county of Guadalupe will be disposed of. There are very few new cases to be tried in Leonard Wood and Quay counties, as the counties are now in much better condition than at the time when court was last held. Except for a few instances of sheep and cattle stealing and one murder, committed by a band of outlaws, the members of which are now in custody, very few serious crimes have been committed.

At the last term of court in San Miguel County there were fourteen convictions, and seven persons sentenced to the penitentiary. With the exception of one woman, convicted of murder on change of venue from Mora County, the convictions were for minor crimes. Sheep and cattle stealing have practically disappeared both in San Miguel and Mora counties. The persons convicted were for the most part transient persons drifting through the country and stopping in this vicinity but temporarily. One feature in San Miguel County is the number of crimes committed by boys under 20 years of age. Of the persons convicted at this last term six were under this age, three being sentenced for burglary. The number of youthful tramps who drift into this vicinity and commit crimes shows an unfortunate condition, and their cases are always difficult to dispose of. A penitentiary sentence does not seem just in many of such cases, and the establishment of a Territorial reform school will furnish a happy solution of the difficulty.

Mora County, from the standpoint of law and order, is in the best condition of any of the counties of this district, and, so far as I know, of any of the counties of the Territory. At the term of court held there last April there was not a single case on docket for trial, and only one indictment of any importance was returned; this was the indictment for murder, in which the defendant, a woman, took change of venue to San Miguel County, where she was convicted and is now in the penitentiary. There were no indictments for sheep or cattle stealing, or crimes of that nature, which in past years were so prevalent in this vicinity.

The summary of the cases pending and disposed of since the last report in the various counties of the district is as follows, to wit:

GUADALUPE COUNTY (NOW QUAY AND LEONARD WOOD COUNTIES).

CRIMINAL CASES.

Pending June 30, 1902	74
Pending June 30, 1903	74

MORA COUNTY.

CRIMINAL CASES.

Pending June 30, 1902	36
New indictments (since)	15
	51
Convictions	2
Dismissed	22
Stricken from docket	2
Venue changed	1
No true bills	2
Pending June 30, 1903	22
Total	51

SAN MIGUEL COUNTY.

CRIMINAL CASES.

Pending June 30, 1902	61
New indictments (since)	55
	116
Convictions	21
Dismissed	34
Stricken from docket	6
Pending June 30, 1903	55
Total	116

OLFAX AND UNION COUNTIES.

By J. LEAHY.

COLFAX COUNTY.

Cases pending September 1, 1902	46
New indictments	92
	138
Cases disposed of	78
Balance now pending	60

Of the new cases returned one was for murder, two for assault with intent to kill, three for burglary, and the remainder were all minor offenses, such as selling tobaccos and liquors to minors, petty larceny, and carrying arms.

UNION COUNTY.

Cases pending September 1, 1902	27
New indictments	38
Total	65
Cases disposed of during the year	44
Balance now pending	21

Of the new cases returned three were for murder, two being disposed of—one by acquittal at the hands of the jury and the other conviction in the first degree. All of the other new cases are for minor offenses, mostly for violation of the Sunday law.

With the exception of the unlawful carrying of arms, assaults therewith, violation of the Sunday law, and selling tobacco and liquor to minors other offenses known to the statute are decreasing.

SOCORRO COUNTY.

By A. A. SEDILLO.

There are 10 civil cases pending in which either the Territory or the county is a party.

There are 69 criminal cases pending, which may be classified as follows:

Cases from justices' court (minor offenses and peace proceedings)	17
Assault with deadly weapon and to kill	5
Carrying deadly weapon	1
Effacing brands of neat cattle	2
Larceny of wire	4
Larceny of neat cattle, sheep, and horses	13
Murder	4
Obtaining money by false pretenses	3
Perjury	1
Violation of butcher laws	3
Violation of school laws	2
Violation of Sunday and gaming laws	14
Total	69

Of the foregoing, 10 are properly grand jury cases, to wit, 8 violations of gaming laws pending on affidavit, and 2 justices' cases docketed as appeals erroneously. Four cases are obsolete peace proceedings from justices' courts. Three cases in which convictions were had heretofore were reversed by the supreme court and remanded during the year, to wit, 1 larceny of neat cattle, 1 larceny of sheep, and 1 assault to kill.

Most of the cases have been pending for a long time.

Socorro County was made a separate district for district attorney purposes by law passed at the last session of the legislature (this year), and since my appointment there has been no term of court held in said county.

DOÑA ANA, LUNA, OTERO, AND LINCOLN COUNTIES.

By WM. H. H. LLEWELLYN.

DOÑA ANA COUNTY.

Cases pending June 30, 1902		52
Cases filed June 30, 1902, to June 30, 1903		51
		103
Disposed of:		
Change of venue	1	
Dropped with leave	13	
Dismissals	26	
No bills	23	
Convictions	3	
Acquittals	2	
		68
Balance pending June 30, 1903		35

OTERO COUNTY.

Cases pending June 30, 1902		30
Cases filed June 30, 1902, to June 30, 1903		59
		89
Disposed of:		
Convictions	18	
Acquittals	1	
Dropped with leave	5	
Dismissals	9	
No bills	14	
		47
Balance pending June 30, 1903		42

LUNA COUNTY.

Cases pending June 30, 1903		30
Cases filed June 30, 1902, to June 30, 1903		83
		113
Disposed of:		
Convictions	38	
Acquitals	2	
Dismissals	16	
Dropped with leave	1	
Change venue	3	
No bills	6	
		66
Balance pending June 30, 1903		47

GRANT AND SIERRA COUNTIES.

By R. M. TURNER.

GRANT COUNTY.

Criminal cases docketed prior to and pending July 1, 1902	42
Criminal cases docketed July 1, 1902, to June 30, 1903	113
No bills docketed July 1, 1902, to June 30, 1903	9
	164
Cases disposed of July 1, 1902, to June 30, 1903:	
Nolle	26
Acquitals	6
Dropped with leave to reinstate	43
Convictions	63
No bills	9
Balance pending June 30, 1903	17
Total	164

SIERRA COUNTY.

Criminal cases pending July 1, 1902	20
Criminal cases docketed July 1, 1902, to June 30, 1903	25
No bills docketed during said year	5
	50
Cases disposed of July 1, 1902, to June 30, 1903:	
No bills	5
Dismissals	2
Convictions	1
Acquitals	2
Change of venue	1
Balance pending June 30, 1903	34
Dropped, with leave to reinstate	5
Total	50

CHAVES, EDDY, AND ROOSEVELT COUNTIES.

By JAMES M. HERVEY.

CHAVES COUNTY.

Cases on docket July 1, 1902	38
Indictments found at October term of court, 1902	50
	88

Convictions at October term of court	4	
Acquittals	1	
Cases dismissed	22	
Cases disposed of by plea of guilty	14	
		41
Cases pending on indictment		47
Number of cases now awaiting action of grand jury		26
Total now pending		73

EDDY COUNTY.

Cases on docket July 1, 1902		28
Indictments found at October term of court, 1902		9
		37
Convictions at October term of court	7	
Acquittals	1	
Cases dismissed	6	
Disposed of by plea of guilty	3	
		17
Cases pending on indictment		20
Number of cases now awaiting action of grand jury		18
Total now pending		38

ROOSEVELT COUNTY.

No cases docketed or indictments found.	
Number of cases awaiting action of grand jury	7

SUMMARY.

Chaves County	73
Eddy County	38
Roosevelt County	7
Total	118

CLASSIFICATION.

Assault (felony)	18
Arson	1
Abusive language (assault by)	2
Bigamy	1
Deadly weapon (carrying, drawing, firing, flourishing, etc.)	11
Fraud (selling mortgaged property, passing bogus paper, etc.)	16
Embezzlement	1
Forgery	1
Gaming (carrying on without license)	5
Homicide	9
Larceny	40
Perjury	1
Quarantine law (violations of)	2
Robbery	1
Sunday law (violations of)	9
Total	118

CIVIL CASES.

Chaves County: Scire facias 5, habeas corpus 1	6
Eddy County: Scire facias 1, tax suits 3	4
Total	10

REPORTS OF EDUCATIONAL INSTITUTIONS.

THE UNIVERSITY OF NEW MEXICO.

By WILLIAM G. TIGHT, *President.*

The school year, which closed with the commencement exercises of June 4, 1903, was a very successful one. Considering the condition under which the university is placed the student attendance was very good. There were twelve graduates from the several departments, distributed as follows:

Preparatory school	5
Normal school	3
Commercial school	1
College of letters and science	1
Music school	2

The character of the work done by the students was maintained at a high standard by the faculty and was pursued in a most satisfactory manner. The relations between the students and faculty were most pleasant and harmonious.

During the year the students enjoyed the privilege of several lectures by eminent men in various walks of life and representing very diverse localities.

The college paper, the Mirage, issued by the students, was a credit to the editorial staff and represented well the literary aud journalistic attainments of the student body. The Mirage began its publication as a weekly with the opening of the school year and has appeared regularly. It will compare favorably with the weekly papers of many institutions which have several times the body of students.

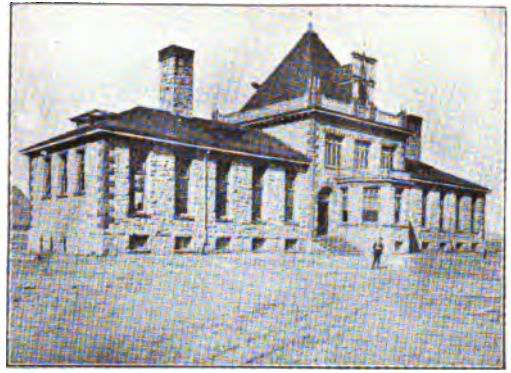
Several gifts and prizes of minor value were presented to the university during the year. While these do not aggregate any great sum, they nevertheless serve to show that the university has many friends who are interested in its welfare and in that of the young men and women who are here obtaining their education. The work of the class room is most important, but the research work done in the scientific laboratories has received substantial recognition beyond the borders of the Territory.

BUILDINGS.

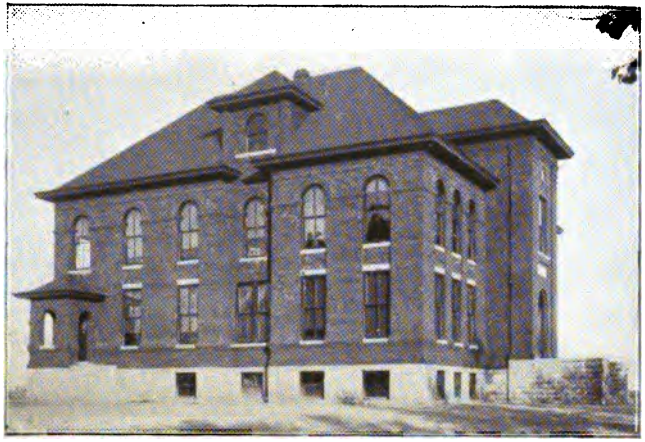
The material equipment of the university has not been enlarged during the year. The present buildings include the Administration Hall, which is a large and commodious four-story brick building. The first floor contains the executive office or reading room, the library, and three large and well-furnished recitation rooms. The second floor contains four large recitation rooms and two offices. The third floor is occupied by a large assembly room. The basement contains the heating and ventilating plants, janitor's rooms, and two large rooms now being used as ladies' and gentlemen's lunch rooms.

The Hadley Climatological Laboratory serves as the home for the science work of the university, and, as you are already aware from former reports, was presented to the university as a gift, largely contributed by Mrs. Walter Hadley, and was established for the exact purpose of investigating the climate of the arid plateau of New Mexico in relation to disease. A broad view is taken of the scope of this work, and many correlated subjects are under consideration. This laboratory occupies a unique position in the field of science, as it is the only one in this country having this special object in view in its founding. That the work done in the laboratory is meeting the expectation of men of science at large and calling attention to the especial advantages offered by the healthful climatic conditions of New Mexico is very manifest. Through the labors of Prof. John Weinzirl, the vice-director, the attention of the trustees of the Elizabeth Thompson Science Fund of Boston has been attracted to this field of work, which is of such far-reaching importance to the whole human race, and they have awarded two gifts to the laboratory, amounting to $125 each, for the years 1903 and 1904, to be used in the investigations now under way.

THE UNIVERSITY OF NEW MEXICO AT ALBUQUERQUE.



THE NEW MEXICO SCHOOL OF MINES AT SOCORRO.



HADLEY CLIMATOLOGICAL LABORATORY AT ALBUQUERQUE.

THE NEW MEXICO NORMAL SCHOOL AT SILVER CITY.

GYMNASIUM.

The gymnasium is a substantial building, 30 by 50 feet. It is provided with the best of apparatus, which has been added to during the past year. Provision is made for physical measurements and record. The physical-culture work is under expert supervision, both for the young men and the young women. Outdoor athletics are encouraged within the bounds of moderatiou.

The faculty of instruction for the school year 1902–3 included: William G. Tight, Ph. D., president, professor of geology; Josephine S. Parsons, principal of the commercial department and instructor of mathematics; Charles E. Hodgin, B. Pd., dean of the faculty, professor of pedagogy; John Weinzirl, M. S., vice-director of the Hadley Climatological Laboratory, professor of chemistry; Carl E. Magnusson, Ph. D., Professor of physics and mathematics; Ethel A. Hickey, A. B., professor of English; Rupert F. Asplund, A. B., professor of ancient languages; Aurelio M. Espinosa, Ph. B., professor of modern languages; John Douglas Walker, director of school of music, teacher of voice; Mabel Stevens Himoe, teacher of piano and history of music; Robert T. Blair, teacher of violin and stringed instruments; Florence S. Chapin, teacher of elocution and physical culture; Mrs. E. D. Quinlan, matron of ladies' cottage; Kate Cunningham, librarian.

I take pleasure in saying that the professors are persons with the highest training, and with but few exceptions have had large experience in university work in older institutions. With such a competent faculty of instruction in our Territorial university there is little need for our people to send their children to distant schools, where, as a matter of fact, they will often come under the instruction of less competent teachers.

THE LIBRARY

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UNIVERSITY GEOLOGICAL SURVEY.

Following the plan already begun by Doctor Herrick, considerable field work in geology has been done during the past year at private expense and in connection with the field instruction of the classes in geology, but for lack of funds the results of the work have not as yet been published. This work was largely confined to the Sandia and San Pedro mining districts and the vicinity of the Albuquerque volcanoes and adjacent mesas. Some very interesting results have been secured.

COURSES OF STUDY.

It will be noted from the catalogue of the university for 1902–3, which is made a part of this report, and from former reports that from the time of the organization of the university up to the present there has been a rapid increase in the amount and variety of the studies offered and in the standard of entrance requirements. This year has been a substantial advance along these lines. The requirements for admission to the preparatory school have been brought up to those of the best academies and high schools of the country. No students are now admitted who have not completed the work of the eighth grade of a public school of recognized standing. The preparatory course, which was three years, has been increased by action of the board of regents, on recommendation of the faculty, to four years. Students who complete the preparatory course are now prepared to enter the freshman class of this or any other university in this country. The commercial and normal courses have also been strengthened.

The college course embraces four years of work, as heretofore, but the plan of studies has been so changed that a greater freedom of election within prescribed limits is granted the student, thereby tending to adapt the course of study more nearly to the individual characteristics and needs of the student.

In thus raising the standard of the work done to four years in the preparatory school and four years in the college the university takes its place, for the first time in its history, alongside of the best State universities of the land. Your especial attention is called to the effect which this constant raising of the standard of the work has had on the attendance of the school in point of numbers. It is a well-recognized fact that the per cent of scholars who remain in school constantly decreases from the primary grades to the high school, and the same law holds good for the higher work of the college. It is therefore a source of constant congratulation to the

people of this Territory that, with a constantly increasing standard of requirement of the work of the university, the university has maintained about the same average attendance of students. Now that the work is up to the recognized educational standards of the land, it may confidently be expected that the next few years will see a very substantial increase in the number of students attending the university. This increase has already been quite apparent this year. It is believed that the regents have shown their wisdom in constantly developing their curriculum at the expense of large numbers, until now the university stands where it was intended by its wise founders that it should stand—at the head of the system of public instruction of the Territory, leading directly on from the twelfth grade of the high school through college. At the same time it has been found necessary to maintain the preparatory school to meet the demands of large numbers of our youth of both sexes who are not so favorably located that they may have the advantages of a high school training. The attendance for the first quarter of the present school year has increased about 42 per cent over that of last year, there being in all departments 115 enrolled, while the total enrollment for the year in all departments was 153, being more than double that of the preceding years.

SCHOOL OF MUSIC.

With the opening of the university in September the work of the school of music was begun along the lines planned by the board. At the close of this, the first year of the music school, two diplomas of graduation from the department of piano were granted. I believe we can say without boasting that the musical advantages offered by this school surpass any in the Southwest.

The large number of students who entered in this department who are taking entire or partial work in music is a gratifying evidence that the opening of this department is filling a real need.

In connection with the regular instruction in music, harmony, and history of music given in this department the director has organized a large and active choral society.

NEEDS.

But little progress has been made in meeting the needs of the university in its growth since my last report to you, and I therefore would repeat my statement of these needs, which are even more pressing than last year.

In pursuance of your instructions, during the summer of 1902 several rooms in the administration hall were furnished for the accommodation of young men, and the cottage which was vacated by the resignation of Mr. Custers as custodian, in June, was furnished as a dining hall, and a few rooms on the second floor were furnished for young women.

The rooms given up for this purpose in the main building are very greatly needed for recitation rooms, and it is essential that this arrangement be only temporary. All the available rooms for both young men and women are taken, and the dining room is crowded beyond its capacity, about thirty boarders being accommodated at the present time. The success of this experiment is certainly added evidence of the very great need at this school of suitable dormitory quarters.

Many parents who would gladly avail themselves of the advantages which the university offers their children for higher education refuse to send them here, where they must be exposed to the temptations of city life. They prefer to send their children to other schools outside of the Territory, where they will be under the full charge of the university authorities. The present arrangement only partially meets this need, and it is earnestly hoped that larger provision can be made by the opening of the next school year.

The university geological survey.—As has already been stated, some work has been done in this line during the year, but it is earnestly hoped that means may be provided whereby this work, so important to the development of the Territory, may be carried forward and the results published for distribution.

Equipment.—The Hadley Climatological Laboratory furnished a most admirable home for the science work of the university, but the laboratories are very greatly in need of added equipment for more thorough instruction. The basement of the building should be finished at once, and with a comparatively small outlay a fair equipment of apparatus to meet the present needs could be provided. This need is most felt in the physical and electric lines, where the demand for more thorough and extended laboratory instruction is imperative. This is a very important part of the work, and in view of the large part which electricity will undoubtedly play in the future development of our Territory it is highly desirable that provision should at once be made for that work in the university.

MAIN BUILDING.

GIRLS' DORMITORY.

SCIENCE HALL.

COLLEGE OF AGRICULTURE AND MECHANIC ARTS AT MESILLA PARK.

Permit me to say, in closing, that I consider the work of the university during the past year has been most gratifying, and that the prospects for the immediate future are very promising. The university is certainly a credit to the Territory, and should be the pride of every loyal citizen who assists in its maintenance.

NEW MEXICO COLLEGE OF AGRICULTURE AND MECHANIC ARTS AND AGRICULTURAL EXPERIMENT STATION.

By LUTHER FOSTER, *President.*

The past year has been one of the most successful in the history of the college. It has been marked not only by important additions to the courses of study, but also by general advancement along all lines of work and the steady growth of the institution as a whole. The attendance has been unsually large and the spirit of general harmony that has prevailed is most commendable. A united effort has been exerted to build up a prosperous institution and make the work in every line the very best possible.

CHANGES IN FACULTY.

The following changes have occurred in the faculty since the last report: Prof. Frank W. Brady, who had been at the head of the engineering department for the past five years, resigned the position, to take effect June 30, and was succeeded by Prof. Charles Mills, who had been assistant in the department for the past nine years. Prof. William A. Sutherland, a graduate of the institution, who had been in charge of the department of Spanish and Latin for the past two years, also resigned, to take effect at the same time, and was succeeded by Prof. M. L. Hoblit, of the Chicago University. In addition to these two important changes, Mr. A. B. Sage was promoted to the position of assistant professor of mechanical engineering, and Mr. J. S. Macgregor, a recent graduate of the college, was elected to the position made vacant by Mr. Sage's promotion. Miss Clara L. Foster, a graduate of the Utah Agricultural College, was made assistant in the department of domestic science, and placed in charge of the work of sewing; Mr. H. C. McLallen, a graduate of Cornell University, was employed as assistant in the agricultural department; Miss Elizabeth E. Shimer, a well-known teacher of Albuquerque, was added to the teaching force of the preparatory department; Miss Pinckney Ford, a former student of the stenography department, succeeded Miss Helen M. Macgregor as stenographer, the latter having resigned after a number of years' faithful and efficient service.

Toward the end of the year Prof. Arthur Goss, who had been at the head of the chemical department for the past ten years, resigned this position to accept the directorship of the Indiana Experiment Station, a position carrying with it the office of State chemist. Miss Edith Davis, who had been associated with the institution as professor of English for the past two years and who had reorganized the work of the department and brought it up to its present degree of excellence, also resigned, and both positions have been satisfactorily filled. The regents have in all cases showed a desire to fill the vacancies that occur from time to time in a way to serve the best interests of the institution.

CHARACTER OF WORK.

The work of the college is confined very closely to the lines of industrial training contemplated by the Morrill Act in establishing and endowing the institution. The education given is substantial and practical in its character and does not tend to lead the student away from the home and out of sympathy with the everyday callings. It stores the mind with general information while giving it discipline, and fits the student for useful, intelligent citizenship.

Such sciences as chemistry, physics, and biology, applied to the various industries of the farm, shop, and home are made prominent. The aim is to cultivate quick observation, skillful manipulation, and accurate judgment. These come from the study of objects (animal, mineral, and plant) themselves by laboratory methods. In connection with the study of sciences practical applications are made in agriculture, horticulture, engineering, and domestic sciences. The industrial requirements of shops, farm, orchard, and household are made a useful education in themselves. They insure the means of earning a living, while they help to form industrial habits and cultivate a taste for the ordinary pursuits. The tendency is to extend the influences of education to broader fields and make them apply to the more practical affairs of life, thus giving their benefits to the masses instead of the select few. The aim is to meet the great demand for an education that aids one to make a living;

to help understand better any work in which one is already engaged and give greater pleasure in doing it; to turn the work of making a living from drudgery to pleasure. The student may return to the occupation of his father, but with wider knowledge and broader sympathies, which will not only be of greater advantage to the community in which he lives, but will also add to his own influence and make him a leader in the neighborhood.

The people are rapidly becoming familiar with the aim and character of this class of colleges and are eager to give their children the benefits of such an education—one intended not alone for discipline, culture, and morality, or a professional education, but to prepare as well for the everyday, industrial pursuits; to make them proficient in some one of these and at the same time broaden their views of life and prepare them for greater usefulness.

ATTENDANCE AND FACILITIES.

The attendance for the past few years has shown a gradual increase of students notwithstanding the fact that the requirements for admission have been twice raised during that period. More encouraging than the increased attendance is the high character and thoroughness of the work accomplished and the tendency of students to take up regular work and to continue it through a full course of instruction. During the year 28 students were pursuing subjects in the agricultural department, 52 in engineering, 21 in domestic science, 16 in general science, 19 in stenography, and 140 in preparatory subjects. Many different things have contributed to the present prosperous condition of the institution as a whole. Among these may be mentioned the popular and practical character of its courses of study, the congenial student life about the college, the excellent library facilities, where all of the best periodicals may be found, the choicest recent literature, and all prominent books of reference, in addition to general and department libraries; a well-organized and systematized athletic association, encouraging regular and systematic outdoor exercises in some of the various field sports. These, together with the healthful location, pure water, and exceedingly mild winter climate, make it an unusually attractive place for earnest, thorough-working students. The low cost of living is also an important factor and makes it possible for many deserving young men and women who depend principally on their own efforts for support to obtain a college education. Under the present system of management many students are enabled to earn at least a portion of their expenses, and a number are paying the entire expense of their attendance by work on the farm, in the shop, at the dormitories, or in and about the buildings. As much of the work as students can do has thus far been reserved for them. To-day no determined, energetic man or woman need go without an education. When such apply to this institution a way is found for them to help themselves. Still another important factor that must not be overlooked in enumerating the sources to which the college is indebted for its present success and prosperity is the united effort of the citizens of the community and the regents and faculty of the college, working as one harmonious unit for its advancement and betterment, to give it that permanence in lands, building, equipment, and management so essential to the establishment of a reputation, both at home and abroad, for the thoroughness of its work, the helpfulness of its courses of study, and the completeness of its equipment. The corps of professors and instructors now contains 26 members, all specialists in their respective lines. This faculty, coming as it does from the agricultural colleges, polytechnic institutes, and universities of the highest standing in the different parts of the United States, naturally incorporates in each distinctive line of work the best methods and facilities of instruction of the various institutions which they represent. It can therefore be readily understood why the college compares well in its methods and character of instruction and equipment with other institutions of its kind.

ADDITIONS TO ITS CURRICULUM.

In recognition of the need of proper training for the making and management of the home, a course in domestic science was added to the curriculum. This provides for instruction in cooking in all its variations and all that directly pertains to it, sewing, cutting, fitting, and a complete system of dressmaking, hygiene, home sanitation, household economics, and all things else pertaining to the home. A kitchen laboratory and a sewing room have been provided with the necessary equipment for instruction and a large number took the work during the year.

After repeated applications to the War Department during the last dozen years for the detail of a United States Army officer to organize and take charge of a military department, the request was finally granted, and Col. Alfred S. Frost, U. S. Army, was detailed, October 30, as professor of military science and tactics, and he reported

for duty shortly thereafter. The work of this new department embraces, in addition to the usual drill and setting-up exercises, regular class instruction in military science and tactics. The National Government has supplied it with cadet rifles, 3-inch field guns and carriages, swords, accouterments, and target supplies. The department is now well organized, and has been very beneficial to the young men.

COURSES OF INSTRUCTION.

The regular courses of study now offered are as follows: A course in agriculture, which is especially strong in the natural sciences and practical subjects pertaining to stock, crop production, fruit growing, and gardening; a course in mechanical engineering, which gives special attention to mathematical and other engineering subjects, carrying along at the same time the practical work of the wood and iron shops; a course in domestic science, which gives thorough training in English, history, mathematics, and natural sciences, and in addition prepares the young woman for future home making by giving her both practical and theoretical instruction in the various specialties of sewing and cooking and other things pertaining to the home; and a general science course, which offers more advanced work in literature and the natural sciences, and which gives greater opportunities for specializing on account of the large number of elective studies. Aside from these regular four-year courses, several shorter courses of a still more practical character are offered—one in stenography and typewriting, which embraces both English and Spanish stenography; one in practical mechanics, bearing more strongly on the manual-training side of the work than the regular course and making it possible for any young man to take up the work without regard to his previous preparation; and one in agriculture, covering all the more practical questions of stock raising, crop production, fruit growing, and truck gardening, for the entrance to which the public schools may give preparation. The preparatory department has been strengthened by raising the entrance requirements and adding a few important lines of instruction to its course. This department is now in charge of a very capable principal, who is assisted by an excellent corps of teachers. It is well equipped in all except suitable quarters, and it gives to the college classes the best-prepared students that they receive.

In all the courses enough is required in the fundamental branches, such as mathematics, English history, the natural sciences, and physics, to constitute a good, liberal education and fit the student properly to make a success of any specialty that he may elect. From the foregoing it will be seen that the student has the same advantages here as in many of the larger institutions, without the disadvantages of such large numbers that the heads of departments never meet all of the students and much less does he or his instructors have any knowledge of their individual personality. Our students average well in all respects with those of other Western institutions. They are earnest and industrious, ready to take advantage of all that is to be gained from college association, and anxious to better fit themselves for the various duties of life. They are unusually loyal to the institution, and excellent college spirit prevails.

IMPROVEMENTS.

Within the year important additions were made to the apparatus and general equipment of a number of departments. In the domestic science department a sewing room was furnished with all things necessary for successful instruction. Additions were made to the tools and machinery of the shops and to the facilities for instruction in the departments of biology and chemistry. On the farm complete equipment for making investigations in irrigation by pumping was secured, besides the numerous tools and machines needed in other experimental work. An addition 80 by 100 feet was built to the corral, increasing the shed room by an area of 14 by 280 feet. The girls' dormitory was papered and renovated throughout during vacation and placed in excellent condition for the beginning of the year.

BUILDINGS NEEDED.

The needs of the institution in the way of buildings was never greater. The failure of Congress to approve the bond issue authorized by the last Territorial legislature was a great disappointment and resulted in positive damage to the college. With the new departments of domestic science and military science and tactics, new buildings seem imperative. The large equipment of arms and ordnance stores furnished by the War Department of the United States Government must be properly housed and cared for, since the Territory is under bond for their return, on demand, in good condition. The head of the department is in urgent need of rooms for him-

self and his student assistants. In short, to put the department of military instruction on a proper footing, it should have a well constructed armory and drill hall. The courses of study and general equipment of the institution in facilities for instruction are equal to those of similar colleges in many of the older States, and students may secure as thorough training in any lines offered. Its professors and instructors are excellently qualified and have proven themselves superior in their special lines of work. In all, excepting buildings, the college ranks as first class. The library has outgrown its present quarters. The space occupied by it now is but little more than sufficient for a stock room for its books. In the shops it is found necessary to divide the students into a number of sections in order to accommodate them. The departments of agriculture and horticulture and domestic science have no quarters of their own. The professors of agriculture and horticulture find it necessary to take their classes from place to place, whenever a vacant period occurs in the rooms of other departments, not having the space of a single recitation room devoted to their special use. It is hoped that the present cramped condition may be relieved at an early date.

THE EXPERIMENT STATION.

The work of the experiment station is growing in importance and the results of its investigations are being felt more and more in all portions of the Territory as well as in portions of adjoining States. It has been made much stronger by the concentration of its work in a single place. Its investigations have been carefully planned, and during the year they have been energetically prosecuted. The main lines of work are of vital interest to the Territory and their successful completion will aid in its rapid development agriculturally. The main effort is now given to problems in irrigation, especially to the alkali lands, and successfully combating fruit pests, particularly the apple worm. Four regular bulletins, an annual report, and 15 press bulletins were issued during the year. They are distributed regularly to over 3,000 readers. No other single force is doing more to attract the attention of the outside world and bring settlers to our fertile valleys. Within the year just past the demand for the station's publications, and inquiries for information concerning the Territory and its resources have been unprecedented. The people are becoming fully awake to the great work the experiment station is doing for them, and apply to it more and more as a source of reliable information. In the last report of the United States Department of Agriculture on the work and expenditures of the experiment stations Dr. True, who inspected this station, said:

"The staff of the New Mexico station has now established a settled policy in station work, and the heads of the departments have been long enough in charge of their especial lines to become familiar with the conditions existing in the Territory and the more urgent needs of those engaged in the different lines of farming. These conditions and the fact that the station is coming into closer touch with the people of the Territory put it in better condition for carrying on work of investigation and for making it of lasting benefit to the Territory than at any previous time in its history."

The experiment station bulletins go to every State and Territory and its biweekly press bulletins go to every agricultural publication in the United States. Through the work of the station improved seeds, new crops, and new methods have been introduced. Effective means of combating the insect pests and treating plant diseases have been brought into use. Its work in this line will be of still greater usefulness in connection with the Territorial laws recently enacted in regard to holding in check and eradicating the various fruit pests. The investigation looking toward the development of the underflow water of the Rio Grande Valley will prove a most valuable work for the Territory. The fact that there is an abundant supply of water within easy pumping distance of the surface is already established, a 6-inch well having furnished more than 1,000 gallons per minute for a sufficient time to show that the supply is practically inexhaustible. The investigation has already shown that it is practicable to sink and maintain casing wells with coarse strainers in the quicksand and gravel where the water is found. It only remains to learn the most economic method of getting the water to the surface.

The soil survey of the Territory is establishing the character of the lands in the different valleys and determining places where alkali is excessive, either as a result of irrigation or otherwise. It is showing, too, that it is feasible to dispose of this surplus alkali by a system of drainage.

The institution as a whole is engaged in a work similar in character and equal in importance to that of the agricultural colleges and experiment stations of other States, and in equipment for this work, competency and efficiency of its faculty, and character and intelligence of its students it stands equally high.

As evidence of the progress the college is making we call attention to the following:

1. Notwithstanding the fact that the entrance examinations were raised for the present year the attendance has been markedly increased. Six students completed the regular four-year courses, 18 went out to positions from the stenography department, and 19 graduated from the preparatory department. The record shows that nearly all of the graduates of the institution hold important positions and are taking active part in the progress and development of numerous industries.

2. The establishment of a course in domestic science, which during the year gave instruction to 17 students in cooking and 22 in sewing; the organization of a military department and the securing of a United States Army officer to take charge of it, and the authorization of the faculty to hold farmers' institutes in various sections of the Territory.

3. The large increase in the number of young men, particularly natives, taking instruction in practical mechanics, making it necessary to separate them into divisions and add to the equipment in order to accommodate them.

4. The wide influence of the experiment station, the better appreciation of its work, and the fact that it is being looked to more and more as authority on the various farm problems of the Southwest.

SCHOOL OF MINES.

By CHARLES R. KEYES, President.

SUPPORT OF SCHOOL OF MINES.

The New Mexico School of Mines was founded by act of the legislature, in 1889. The act creating it provides that the school of mines shall be supported by an annual tax of one-fifth of a mill on all taxable property. This levy was increased by the legislature in 1899 to twenty-seven and one-half one-hundredths of a mill. The thirty-fourth general assembly of 1901 recognized the growing importance of the school by further increasing the tax levy to thirty-three one-hundredths of a mill.

The object of the School of Mines created, established, and located by this act is to furnish facilities for the education of such persons as may desire to receive instruction in chemistry, metallurgy, mineralogy, geology, mining, milling, engineering, mathematics, mechanics, drawing, the fundamental laws of the United States, and the rights and duties of citizenship, and such other courses of study, not including agriculture, as may be prescribed by the board of trustees.

By act of Congress, June 21, 1898, to make certain grants of land to New Mexico, and for other purposes, the New Mexico School of Mines received for its share 50,000 acres for its support and maintenance.

This liberal and valuable grant will eventually place the institution among the leading schools of technology in the country. Already valuable aid is beginning to flow toward the school through this newly opened channel. A fund of over $13,000 has been recently made available from the sales of certain portions of these lands, and the thirty-fourth legislative assembly has authorized the bonding of any portion of this grant of lands, in order more thoroughly to equip the school with necessary buildings and apparatus for the proper execution of its growing needs.

The thirty-fifth legislative assembly further enlarged the permanent income of the school by increased millage, the total now being forty-five one-hundredths of a mill.

ATTENDANCE.

The year just closed has been by far the most prosperous one in the history of the institution. The enrollment of the school has been upward of 50 per cent greater than during any other previous year, reaching nearly 100 students. Of these, about one-half can not be counted as local students living in Socorro. The number of students taking the advanced and strictly technical work has very largely increased, not only over last year, but over every other year since the institution has been organized. A number of the students in attendance taking work along professional engineering lines were from other higher institutions of learning, and this feature is a very gratifying one.

The outlook for the coming year is very flattering in point of attendance. There promises to be more than double the number over that of the year just closed.

One point merely touched upon in the report of a year ago has been very greatly emphasized. The demands of young men from all parts of the country for advanced instruction and actual work in practical mining are already being felt by the school because of its exceptionally favorable situation in the heart of the oldest and greatest mining districts of the continent. The New Mexico School of Mines also is the

only institution in the country that stands at the very entrance to the immensely rich mining districts of old Mexico, where, as a result of the recent introduction of Saxon capital and Saxon energy, phenomenal developments are now going on. Nowhere else in the United States are there such opportunities offered for the careful study of the native Mexican methods of mining and smelting. Nowhere else in our country is the use of the Spanish language, so necessary in dealings with the Mexican people, so easily put to practical test.

OBJECTS OF THE MINING SCHOOL.

The ideal to which the New Mexico School of Mines tenaciously holds is the practical directing of young men to take active part in the development of the mineral wealth of our country and the world.

The New Mexico School of Mines is a State institution. It was established primarily to promote mining and mining interests in southwestern United States. However, it has a much wider scope. It is intended to provide adequate facilities for the thorough training of men in the ways of modern mining. The purpose is to meet the demands for a mining education (1) by young men who are residents of New Mexico, (2) by men living in the great Southwest, and (3) by students from other parts of the country and world desiring to avail themselves of the peculiar advantages of this region.

During the past quarter of a century the development of the mineral wealth of the nation has been phenomenal. Of late the call for adequately prepared young men to direct mining enterprises in all their various ramifications has been unprecedented. The mining schools located in the chief mining regions have been taxed beyond their capacities and have been obliged to turn away students.

As a technical institution the field of a school of mines is commonly considered to be outside that of ordinary college and university instruction. In the case of the New Mexico school, location has made it necessary to trespass somewhat upon both the other fields of modern higher education. On account of the unexcelled natural surroundings for original research work concerning problems relating directly to mining and geology, provision for advanced work is made by the school. It is not believed that the best results are secured by shutting out the humanities from the technical school. There is offered, therefore, instruction in the most important of these branches, a knowledge of which goes to make up a liberal education. All students who are not already college graduates are encouraged in every way to take up as much as possible of the broader work.

In the training offered by the school there is noteworthy concentration of effort. There are many advantages in the direction of effort along few lines. In contrast with the many diversions that necessarily exist in most technical institutions of learning, where all practical branches are equally represented, singleness of purpose is a leading feature in the New Mexico School of Mines—the student body in all its parts becomes immensely more sympathetic; the workings are more perfectly harmonious; instruction is more advantageously given.

Several features contribute to the success of this institution as a school of mines. The unique natural surroundings of the school create an invigorating mining atmosphere which is entirely wanting in situations away from the mines and mountains. The concentration of energy growing out of the special methods of instruction happily adapts the student so that he gets the most out of his efforts. The broad practical experience in fields outside of the school forms an integral part of the training in mining engineering. The encouragement for advanced and original work is such as is seldom offered by purely technical institutions. Moreover, at all times the student is made to feel that he is a part of the school organization, and that his success is one of the best proofs of the school's success.

If we look into the history of modern mining schools and modern universities, we find that each becomes most celebrated along the line for which its locality is best known on account of its natural surroundings. Few institutions of learning are more dependent for success upon what may be called the accident of geographical location than the mining school. It may be truthfully said that no mining school is more fortunately situated, so far as natural environment is concerned, than that of New Mexico.

The New Mexico School of Mines enjoys the natural advantage of being located in the midst of a region peculiarly rich in minerals of nearly all kinds, and is within easy reach of the most varied geological conditions, all of which are within a radius of a score of miles of Socorro. Almost the entire geological column, from the precious-metal-bearing formations of the Archæan to the coal beds of the Tertiary, is here exposed. The industrial processes connected with mining and metallurgy may be

seen admirably illustrated at Magdalena, Kelly, Rosedale, San Pedro, Hillsboro, Cooks Peak, Silver City, Pinos Altos, Los Cerrillos, Gallup, Carthage, and elsewhere within easy reach of the school. These illustrate the most modern methods of mining, milling, ore dressing, concentrating, smelting, lixiviation, chlorination, etc., as well as the native Mexican methods, which are worthy of careful study, since the like can not be seen elsewhere in the United States.

The grounds immediately adjacent to the School of Mines include irrigable land, plateaus, and mountain formations, all affording an excellent field for practice in surveying, the laying out of railroads and irrigating canals, topography, mine engineering, and geology, so that students can be prepared at the very doors of the school in those branches which usually require tedious excursions from other schools.

It is proposed that much of the advanced professional work of the school shall be of an original nature, to the end that the graduates may be skilled, theoretically and practically, in the very problems which they as professional men will be called upon to solve. In connection with this work it is hoped to enlist every chemist, geologist, mining engineer, metallurgist, and other scientific investigator capable of observing and recording professional experience in the region. This work will be carried on by the advanced students, under the direction of the professors, and will involve the collection of notes, sketches, maps, and specimens, and the results of directed observation in all matters relating to the sciences and arts embraced in the courses of study. The results of these observations, together with illustrations and analyses, will be printed from time to time in the scientific press or in the special publications issued by the school. While this plan of instruction will furnish material for practical and original research on the part of the advanced students, it is believed that it will also be of great practical utility to the industries of the Southwest, and that in an important sense the school will have for its students not only those who may study within its walls, but also the greater part of the educated mining population of the region.

The subjects for such researches in geology and mining and in the reduction of the ores of lead, silver, gold, and copper, are so numerous that it is impossible to attempt to do more here than to mention the fact that the conditions of climate, drainage, water supply, and geological structure in New Mexico differ greatly from the conditions existing in other parts of the Rocky Mountains, giving rise to new problems in practice. These problems are not by any means all that deserve attention. The investigation of the ores of iron, manganese, aluminum, cobalt, nickel, tin, and quicksilver, together with the beds of coal, salt, alums, building stones, mineral paints, cement rocks, marls, etc., will be directly in the line of the advanced laboratory work of the school, and every student who undertakes such work will be encouraged in every possible way to accomplish the best results.

During the last year of his course every candidate for graduation is required to make a thoroughly scientific investigation of some subject connected with his course of study and to embrace his results in a thesis, which is subsequently published.

These advantages, which may constantly be made use of, thus become essentially a part of the school's equipment. To the greater part the student not only has access, but he is required, as an integral part of his course, to visit and critically inspect, under the direct supervision of his instructors, the various plants and works, and to make intelligent reports. Being obliged from the start to make the most of the exceptional opportunities presented, he quickly falls into the spirit of his present and future work, and at once necessarily acquires for his chosen profession a sympathy that is seldom attained, except after school days are over and after long and strenuous effort.

Contact with practical and successful men week after week is a complete technical education in itself, even if it were not an essential part of a systematic course. The student receives an inspiration for productive work that is rarely otherwise acquired. His faculties of observation are sharpened. He has hopes well grounded for grand achievements. Everywhere he is able to find the most forceful illustrations of the abstract principles that are presented to him. In the practical courses he is continually reminded of the commercial bearings of his efforts. In the more purely scientific courses he is continually brought face to face with the specific bearings of his observations upon the universal problems. The lecture room, the laboratory, the field, all are equally necessary in a technical and scientific education.

THE FACULTY.

The faculty of the New Mexico School of Mines is probably not only the strongest ever brought together in any educational institution in New Mexico; but it is doubtful whether it is surpassed by the teaching corps of any similar institution in this country. As an index to its high proficiency, it is worthy of special note that in the

staff of instructors are representatives of no less than 23 of the leading universities, colleges, and technical schools of the United States and 4 European universities.

The personnel of this body of professors is representative of such thorough technical training and broad practical experience in affairs relating directly to the mining industries, and such high scholarship, that it may be deemed pardonable if the full list of names is here presented:

Charles Rollin Keyes, A. M., Ph. D., president of the school; professor of geology of mineral deposits (B. S., Iowa State University, 1887; A. M., Iowa University, 1890; Ph. D., Johns Hopkins University, 1892; university scholar, J. H. U., 1889; fellow in J. H. U., 1891; fellow by courtesy, J. H. U., 1892; assistant, U. S. Geological Survey, 1889–1892; chief geologist and paleontologist, Missouri geological survey, 1890–1892; assistant State geologist of Iowa, 1892–1894; director of bureau of geology and mines of Missouri, 1894–1897; travel in Europe, 1897–98; consulting mining geologist, 1890–1903; consulting geologist, Santa Fe Central Railroad Co., 1902); Francis Church Lincoln, S. B., E. M., professor of metallurgy (S. B., Massachusetts Institute of Technology, 1900; E. M., New Mexico School of Mines, 1902; assayer to San Bernardo Mining and Milling Co., 1900; chemist to Butterfly-Terrible Gold Mining Co., 1900–1901; professor of chemistry and metallurgy, New Mexico School of Mines, 1901–2); Emmet Addis Drake, A. M., professor of languages and of English (A. B., Wisconsin University, 1882; A. M., Wisconsin University, 1887; assistant engineer Northern Pacific Railroad Co., 1882–83; instructor in rhetoric and oratory, Wisconsin University, 1883–84; instructor in Missouri School of Mines, 1884–1891; general manager Columbia Mining Co., 1891–1897; editor of Socorro Chieftain, 1900–1903; professor in New Mexico School of Mines since 1897); Oliver Russell Smith, B. S., C. E., professor of civil engineering (B. S., Kansas State Agricultural College, 1898; C. E., New Mexico School of Mines, 1902; graduate student, Kansas State Agricultural College, 1898–99; graduate student, Kansas State University, 1899–1901; instructor in mathematics and drafting, New Mexico School of Mines, 1900–1902; assistant surveyor, United States General Land Office, 1902; assistant professor of engineering, surveying, and drafting, New Mexico School of Mines, 1902; city engineer of Socorro, 1902); J. F. Atkinson, B. L., acting professor of mathematics (B. L., Stevens College, 1892; graduate student, 1892–1894; instructor in mathematics, Knob Noster High School, 1895–96; graduate student, Missouri State University, 1896–97; assistant in mathematics, New Mexico School of Mines, 1898–1901; graduate student, California University, 1900–1901; instructor in mathematics, New Mexico School of Mines, 1901–2; assistant professor, New Mexico School of Mines, 1902–3); Charles Thayer Lincoln, S. B., acting professor of analytical chemistry (S. B., Massachusetts Institute of Technology, 1901; chemist with American Bell Telephone Co., Boston, Mass., 1901–2; assistant professor of analytical chemistry, New Mexico School of Mines, 1902–3); Robert Nelson Hartman, A. B., Ph. D., professor of chemistry (A. B., Pennsylvania College, 1891; Ph. D., Johns Hopkins University, 1894; professor of natural science, Susquehanna College, 1894–1896; instructor in chemistry, Tufts College, 1896–1899; professor of chemistry, Colorado School of Mines, 1899–1903); Carl Edward Magnusson, B. E. E., M. S., Ph. D., professor physics and electrical engineering (B. E. E., Minnesota State University, 1896; scholar in physics, Minnesota State University, 1895–1897; graduate student, Minnesota State University, 1896–97; M. S., Minnesota State University, 1897; instructor in sciences, St. Peter State High School, 1897–98; graduate student, Wisconsin State University, 1898–1900; fellow in physics, Wisconsin State University, 1899–1900; Ph. D., Wisconsin State University, 1900; instructor in physics, St. Cloud High School, 1900–1901; professor of physics and mathematics in New Mexico University, 1901–1903); ——— ———, professor of mechanical engineering; Royal P. Jarvis, M. E., professor of mining engineering (M. E., Colorado School of Mines, 1897; assayer and chief chemist, Bimetallic Smelting Co. (Leadville), 1897–1900; graduate student, Columbia University, 1900–1901; chief chemist and assayer, Compania Metallurgica de Torreon (Mexico), 1901–1903; assistant superintendent, same, 1902–3); Rufus Mather Bagg, A. B., Ph. D., professor of mineralogy and petrography (A. B., Amherst College, 1891; Ph. D., Johns Hopkins University, 1895; assistant in geology, Johns Hopkins University, 1895–1898; assistant geologist, New Jersey geological survey, 1892–1895; assistant geologist, U. S. Geological Survey, 1894–1898; acting professor of geology, Colorado College, 1898–99; honorary mineralogist, department of mining and metallurgy for commissioner-general of United States to Paris Exposition of 1900; consulting mining geologist, Colorado Springs, 1900–1903); Marcus Antonius Sayler, B. S., M. D., professor of biology (B. S., South Dakota College of Agriculture and Mechanic Arts, 1886; instructor in biology, South Dakota College of Agriculture, 1885–86; M. D., Minnesota State University, 1887); ——— ———, professor of machine design and drafting; Judge Daniel H. McMillan, lecturer on mining law

(ex-judge United States district court, fifth district of New Mexico); Clarence L. Herrick, B. S., Ph. D., lecturer on geology (B. S., Minnesota State University, 1882; Ph. D., 1888, University of Leipsic); Clyde Melton, B. S., instructor in mathematics (B. S., Georgia State University; principal Abbeville public schools, 1897–98; teacher in Spokane public schools, 1898–1900; Wallace schools, 1901–2; principal San Marcial public schools, 1902–3); Leon Dominian, B. A., instructor in mathematics (B. A., Roberts College (Constantinople), 1898; graduate student in mining, University of Liege, 1898–1900; assistant U. S. Geological Survey, 1903); Dell Frank Riddell, Ph. G., B. S., instructor in chemistry (Ph. G., Chicago College of Pharmacy, 1896; B. S., Nebraska State University, 1901; professor of chemistry, Sioux Falls College, 1901–1903); Gay Montague Hamilton, B. S., assistant in geology (B. S., Nebraska State University, 1903); ————————, assistant in metallurgy; Anne W. Fitch, librarian; R. H. Berry, registrar; M. P. Hunter, mechanician.

ELEVATION OF THE STANDARD OF STUDY.

Since in recent years the strictly professional character of the occupation of mining engineering has come to be generally recognized and has been put on equal footing with the professions of law, medicine, and ministry, it has become a question in all technical schools of how to best readjust the curriculum so as to lead up to strictly professional work of university standard. It is quite manifest that it is impossible to admit students directly from the high school and permit them in the usual period of four years to be graduated from the professional school.

To overcome this difficulty in a measure and at the same time maintain a high standard of graduation requirements the New Mexico School of Mines, in the recent complete reorganization of its curriculum demands, especially in mathematics, something more than ordinary college entrance requirements before regular courses are begun. A year's previous notice enables the student to shape his last preparatory year so that this adjustment may be readily made. The ambitious student may then receive his college work in three years and receive his bachelor's degree, and in another year he may have conferred upon him the degree of engineer of mines or of civil engineer. Thus at the end of four years he is able to enter actively into his professional work.

But the student works during the summers, each of which is equivalent to half a school year. He gets more than six years' training in four years. Such an arrangement is not always possible outside of the technical school, the natural surroundings of which peculiarly fits the institution to such a plan. The field work in surveying takes whole days and can not be satisfactorily undertaken during regular term times. Assaying, ore dressing, roasting, amalgamation, smelting, and the various treatments of ores, mine surveying, mine inspection, geological field work, study of ore genesis, and special experimentation work all take weeks of work, ten to twelve hours a day. These operations may be carried on on a large scale, and mill runs of upward of 100 tons of ore may not be unfrequently made. This work is done during the first two summers, and the student gets a practical training that he can get in no ordinary laboratory. The third summer may be put in in like advanced experimentation, but is frequently devoted to actual work in some mine, smelting plant, or on some surveying corps.

In addition to an actual saving of time, this arrangement permits the student to specialize on broad lines in a way that is not otherwise possible. Specialization, practice, and independent investigation, in fact, form the foundation upon which the reorganized New Mexico School of Mines rests.

Besides having a broad, general culture, to paraphrase a recent writer, the mining engineer must be par excellence a mining engineer, and besides being a mining engineer he ought to know more about some particular branch of mining engineering than anyone else. This clearly alludes to the professional character of the occupation. As such it presupposes a special training corresponding to that now required to enter the practice of the law or medicine.

On this plan the mining engineer in his training may choose any one of three special branches of the subject. He may develop his talents on the mechanical side of mining engineering, on the metallurgical side, or on the geological side. All are equally important in modern mining, and modern mining demands expert work.

COLLEGE AND TECHNICAL COURSES.

The school offers the following regular courses of study: (1) Mining engineering; (2) civil engineering; (3) metallurgy and chemistry; (4) geology of mineral deposits.

Each course covers four years, including summers. During the first year the studies

are nearly identical for all courses, but after that they rapidly diverge These courses lead up to the degrees of bachelor of science (B. S.), mining engineer (E. M.), civil engineer (C. E.).

It is expected that the entrance requirements will be somewhat more than those for ordinary college admission, so that the student virtually enters the second college year. Upon the satisfactory completion of the regular course at the end of three years the bachelor's degree is conferred, and at the end of the year following—the fourth year—the engineer's degree is given. The summer work, taken in connection with the work of the regular school year, develops rather more than the usual requirements of technical schools and colleges.

In the courses of metallurgy and chemistry and of the geology of mineral deposits excellent opportunities are offered for advanced work, extending over three years beyond that offered in the regular college work.

SPECIAL COURSES.

In addition to the four regular courses scheduled several special courses are offered to meet the demands made by persons of mature age and more or less practical experience in mining.

The special courses offered during the ensuing year are: (1) Assaying; (2) mine surveying; (3) land surveying; (4) prospecting; (5) practical mineralogy.

The full description of all advanced courses will be found in the regular edition of the Annual Register.

IMPROVEMENTS OF THE CAMPUS.

The campus, which consists of 20 acres in the northwest part of the city, has been beautified somewhat during the past year. Drives and walks have been laid out, groves of trees planted, and parts of the grounds sown with grass.

The citizens of Socorro, having become actively interested in the matter, propose to construct a new and direct avenue to the School of Mines grounds. Eventually this will be made one of the finest roadways in New Mexico. Rows of trees are to be planted on each side, those in front of the campus having already been set out.

IMPROVEMENTS ON BUILDINGS.

As originally planned the chemical building was designed with particular reference to the needs of a modern laboratory in chemistry. Ever since the building was first finished lack of other necessary buildings has prevented the chemical building from being used entirely for the purposes originally intended. During the present year the plans have been drawn up for arranging the entire building upon the lines originally laid down.

The recently constructed wing of the new Engineering Hall, which had to be at first used for recitation purposes, is now devoted to its legitimate occupancy.

Owing to the insufficiency of adequate buildings to accommodate properly the student body now in attendance, it has been necessary to rent one of the public school buildings, known as the Socorro Building. Thus, through the generosity of the school board of the city, the trustees of the School of Mines were able to provide additional quarters, which were very greatly needed. This building is a commodious structure, two stories high, substantially made of Socorro cream brick, with gray granitoid trimmings. It is especially adapted to recitation purposes.

During the past year negotiations were entered into with the St. Louis Smelting and Refining Company for the purpose of acquiring by the School of Mines the Rio Grande Smelting Works for its metallurgical department and for its mechanical-engineering and electrical-engineering work. It is expected that the work of remodeling and adapting this plant to the needs of the school will be completed before the opening of the next school year, in September. For more than a decade the Rio Grande Smelting Works, at Socorro, was one of the most important plants in southwestern United States. Recently the management found it advisable to concentrate its work somewhat. In consequence the Rio Grande plant became inactive as a commercial property. Through the generosity of the secretary of the company, Mr. H. M. McChesney, the New Mexico School of Mines has been able to practically close negotiations whereby it now comes into possession of this property for its metallurgical department and for the mechanical and electrical engineering work.

The property is located a short distance from the campus of the school. It consists of 280 acres of land, on which are located upward of 30 substantial buildings, large and small. An abundant and very pure water supply is obtained from the springs in the Socorro Mountains and is piped to all parts of the grounds. A switch

with six spurs, from the Atchison, Topeka and Santa Fe main line, reaches all the principal buildings.

With some alterations, the entire plant will be more especially adapted to the uses of the school. It is believed that already the school has the most extensive and best equipped laboratory of practical metallurgy in the country. With complete sampling works, stamp mills, roasting furnaces, and blast furnaces, the intention is to carry on every method of treatment of ores on a scale not usually undertaken. Tests may be made on ores in quantities varying from a few pounds up to ton lots, car lots, or even mill runs of 100 tons.

Besides the ordinary metallurgical experience demanded of engineering students, practical experimentation in ore treatment is made a prominent feature of the work. Complex ores which do not separate cleanly and satisfactorily or which do not reduce readily or which do not save sufficiently high percentages may be brought here and worked by the various methods or run through different machines or a combination of machines until the required work is properly done. For these tests the operators may accompany the samples or ship them in and have the work done under experienced direction. Practical and systematic experimentation constantly goes on with the view of improvement of methods, devices, and machinery. Particular attention is to be given to magnetic separations. In fine, the whole arrangement is that of a thoroughly practical and professional metallurgical laboratory on a large scale. The arrangement of the various buildings are represented in the accompanying ground plan. The following is a list of the principal buildings: Special experimental laboratory, roasting plant, stamp mill and concentrating plant. smelting plant; sampling works, power house, boiler house, pumping station, foundry and blacksmith shop, machine shop, mechanical-engineering building, assay laboratory, pumping station, bath house and reservoirs, matte house, sampling sheds, storage houses, scale house, club house, mess house, ore bins, and dwellings.

NEW EQUIPMENT.

Among the various pieces of apparatus which have been added during the year several instruments deserve special mention. The engineering department has received a fine large engineer's transit and all accessories, manufactured expressly for this institution after improved designs by the Gurleys, of Troy. There is included an extension tripod, auxiliary telescope, reflector, gradienter attachment, diagonal prism, and solar apparatus.

In the mineralogical department there has recently been added to the equipment a new-style large microscope, manufactured especially for this institution by Reichert, of Vienna. It is constructed especially for obtaining fine results in micro-photographic work. The stand includes a continental model substage with rack and pinion, an Abbe substage condenser, with iris diaphraghm, plane and concave universal mirror, triple nose piece, and a full set of objectives and eyepieces. Among the accessories are a micrometer eyepiece, compensating eyepiece, polarizing apparatus, stage micrometer, drawing apparatus, quartz wedge, quarter-undulation mica plate and other necessary pieces.

Among the series of thin slices of rocks are a collection of types of the massive crystallines of Europe, prepared by Krantz, of Bonn, and completely illustrating Zirkel, sets of Maryland massives, and other American rocks and minerals. The Sturtz collection of European rocks, illustrating Rosenbusch, and large miscellaneous collections are expected to be soon available for study.

A rapidly growing collection of typical igneous rocks and crystalline schists of New Mexico will afford material for thin slices, obtained chiefly in connection with systematic investigations that are now being carried on.

In the chemical laboratories a new Troemner analytical balance of new design has been acquired.

The practical metallurgical work is planned to be done entirely in the Rio Grande Smelting Works.

In the boiler house is a battery of boilers of 600 horsepower. They are of different types and so arranged that they may be operated separately or in conjunction. Two of these were made by Babcock & Wilcox, of New York, one by Hendrie & Bolthoff, of Denver, and one by Henstry & Meyer, of Denver. There are also two Washington steam pumps for use in case of emergencies. The boilers are supplied from a tank of 50,000 gallons capacity, which is filled by pipes from the springs. The overflow passes into a reserve reservoir near the boiler house, and this is also connected with a much larger overflow reservoir.

These boilers supply a number of engines of various sizes. In the power house are two 125-horsepower Porter-Allen engines, manufactured by the Southwark

Foundry and Machine Company, of Philadelphia, so arranged, whenever deemed desirable, as to be coupled either by clutch or belt; a 50-horsepower upright Westinghouse standard engine; a 35-horsepower Edison dynamo No. 6, built by the Edison Machine Works, of Schenectady, N. Y., and six Baker's rotary-pressure blowers for the blast furnaces, made by Wilbraham Brothers, of Philadelphia. Shafting extends to the various other buildings, or the power is transmitted to the more distant by means of rope belting. The generator, besides furnishing electricity for other purposes, supplies a complete lighting system for the whole plant. There are in addition several engines of smaller capacity.

The complete description of this plant and the metallurgical, mechanical, and electrical equipment will be found in a special circular soon to be issued by the School of Mines Press.

UNIVERSITY CLUB.

Recently a commodious brick residence has been rented for the headquarters of the University Club, a social organization composed chiefly of the professors in the school and a number of the students. The house is already nicely furnished and living rooms are provided for a limited number of members. The parlors and dining room are open to students other than members, under certain regulations. In the library and parlors are the daily newspapers and current magazines, where a pleasant hour or two may be spent each day. The University Club also offers facilities for proper entertainment of visitors to the school.

GEOLOGICAL SURVEY.

The organization of the geological survey was effected for the express purpose of (1) obtaining valuable data relative to the mining resources of New Mexico, (2) disseminating this useful information among those interested in our greatest industry, and (3) training students in systematic investigations of mineral wealth according to the most modern methods.

The mineral treasures which are constantly coming to light in the neighboring States and other parts of the country give us every reason to believe that we have not as yet availed ourselves to the extent that we might of the natural riches which nature has bestowed upon us, and suggests the expedience of a more thorough examination than has hitherto been made. There is now a general feeling pervading our Commonwealth that great benefits would be derived from an economical investigation of the natural resources of our domain. Such an accurate geological and mineralogical survey by practical and scientific men leads to important discoveries. Not only are the advantages immediate but the results of this series of researches have a lasting effect in aiding individual efforts for many years to come. At the present time more labor and money is wasted annually in the region in fruitless searches for mineral wealth than would support a liberal survey for years.

The geological character of a district indicates its features of relief, its agricultural capabilities, its mineral wealth; and a geological map serves every citizen as a faithful guide, giving him reliable information concerning his property and effectually protecting him against the wiles of nomadic speculators.

Already much valuable information has been accumulated by the various members of the geological corps. A preliminary geological map of New Mexico is rapidly approaching completion. A number of reports on various mineral deposits are in course of preparation. Several of these reports are soon to be presented. Both the economic and scientific aspects of the various questions are discussed.

Another purpose of the geological survey is to give the student practice in the administrative features of public scientific work and the methods of correlated work.

THE LIBRARIES.

The libraries of the New Mexico School of Mines consist of a general library and department libraries.

In the main library are the works of reference, the encyclopedias, dictionaries, journals, magazines, proceedings of the learned societies, laboratory publications, periodical issues of other colleges, reports of Federal, State, and foreign surveys, official maps, plats, and atlases, a complete set of the publications of the school, and volumes on history, travel, and philosophy.

Libraries are located in the several departments of the school. These are essentially working libraries. They consist of carefully chosen treatises, text-books, monographs, special contributions, and authors' separates, pertaining to the respec-

tive divisions. Each department is under the direct supervision of the professor in charge, and is open, under certain regulations, at all reasonable times.

The general library is in charge of a librarian, who also supervises the purchase of books, the cataloguing of all books, the issuing of those works not withheld from general circulation, directs the distribution of the school publications, and arranges for the exchanges. The librarian also is in charge of the general reading room, where the current periodical literature is to be found upon convenient tables.

The libraries are growing rapidly. During the past year many valuable additions have been made, including some complete sets of publications of technical institutions. Additional bookcases have been installed. An entire rearrangement of the books is going on. An elaborate and elastic scheme of cataloguing on the card system has been devised, so that the libraries will be thoroughly adapted not only for reference but as working libraries.

Every effort is being made to make the files of the various technical journals, the transactions of engineering societies, and the scientific periodicals as full as possible. Contributions of early volumes and numbers especially are earnestly asked. Due credit will be given donors.

The private libraries of the professors are available to advanced students. As soon as suitable arrangements can be made and proper space allotted to it, it is expected that the president's private library, consisting of upward 2,000 bound volumes, and of upward 3,000 pamphlets and authors' reprints, chiefly on the subjects of mining, geology, and mineralogy, will be made accessible to students engaged in advanced work and original investigation.

MINING MUSEUM.

A rather comprehensive plan for a complete museum of mining has been formulated. It includes a separate fireproof building especially adapted for museum purposes with large display halls on the first and second floors, around which are arranged smaller rooms for special collections and for research work, and with workrooms and storerooms in the basement.

The collections will aim to illustrate as fully as possible the following departments: Ores and ore genesis; constructional materials; rocks and minerals; geological structures; models of mines; mining engineering; constructions; materials illustrating the history of mining; metallurgical products; the mineral resources of New Mexico and of the Southwestern United States, and models of mining machinery. Accompanying these exhibits will be a full series of maps, charts, plans, and photographs as further illustrations.

Temporarily the collections of ores, rocks, minerals, and other illustrative material are housed in the east wing of the Chemical Building. The scheme is to exhibit as completely as possible: (1) Mineral resources of New Mexico; (2) natural resources of Southwestern United States; (3) typical mineral deposits of North America; (4) selected mineral examples from the classic localities of the world.

The collections are divided into (*a*) an exhibition series, which is arranged in glass display cases, and (*b*) study series, which are placed chiefly in tiers of shallow trays. Of necessity by far the greater portions of the specimens are not for public display.

In addition the collections of the president will be soon accessible to the advanced student. These consist of a small but carefully selected series of crystals, collections of crystalline rocks, chiefly from type localities of Europe and this country, and working suites of fossils, illustrating structures, and the types of life from all the various geological formations, both American and European, these being especially rich in crinoids, which number upward of 2,500 specimens.

TECHNICAL AND SCIENTIFIC SOCIETIES.

There are a number of organizations in connection with the School of Mines which have for their object the presentation and discussjon of technical papers. These societies hold regular meetings and are open to the public. The membership of the societies includes the professors, assistants, advanced students, and elected professional men of New Mexico. Lectures by professional men and alumni of the school are provided for during the year.

The Engineering Society meets monthly under the presidency of Professor Smith. At each session a formal paper is presented on some notable project of mining, metallurgical, civil, mechanical, or electrical engineering. A discussion follows in which all members take part.

The Scientific Association holds sessions monthly, with Professor Drake as president. The Scientific Association includes among its membership all those persons

who wish to avail themselves of the opportunity to attend lectures or the reading of papers on subjects of broad scientific interest. The discussion following may be taken part in by all members. At least once a year some eminent scientist is invited to give a lecture under the auspices of the organization.

The Mining Club is organized partly for intellectual improvement and partly to promote sociability among students and professors, and meets fortnightly. Professor Lincoln is the president.

Other bodies of students and professors hold weekly meetings in the laboratories for the reading and discussion of engineering and technical journals. In the several departments of the school seminaries are also held.

INAUGURATION OF SUMMER WORK.

Beginning with next year work will be conducted during the entire summer, the term being seventeen weeks, which will count the same as a half year.

A "summer school," in the ordinary meaning of this term, is not held at the School of Mines. As may be noted by reference to the calendar, the academic year is divided into two semesters of seventeen weeks each. The summer term of sixteen weeks counts as a full half year. While no regular lecture courses may be given during this session the work of the school goes on under the direction of a committee of the faculty.

For the summer term is reserved all such work as demands much time, uninterrupted by diversions. Among the courses that are best carried on at this time are ore dressing, various metallurgical processes, assaying, railroad, land, and mine surveying, mine inspection, certain phases of design, engineering experimentation, geological field work, and thesis work. Certain courses in drafting, certain laboratory work, and mapping may also be advantageously engaged in.

Not all of the work of the character mentioned need be done under the direct supervision of the instructor in charge. Nor is it necessary that some of the more advanced phases of it be done altogether in this institution. Work may be done outside with the advice of the professor under whom the course is usually conducted, and he need be consulted only so often as he may think advisable. These are cases in which the student attaches himself to some regular railroad corps, to some reducing works, or to the field party of a topographical, hydrographic, or geological survey, when such work comes directly in line with his regular work.

In pursuing the regular professional summer work in the field, whether for surveying, mining, or geologic mapping, a camp is established at some convenient place and the work carried on systematically day after day, in regular fashion, until satisfactorily completed, when the camp is moved to another advantageous locality. The different camps may be adjacent or far removed from one another. Moreover, the kinds of effort expended at the various camps may be wholly different. One of the main objects is to give the student as broad and as varied an experience as possible. By these courses the student is given far greater opportunities for extended and continuous field practice than it is possible for him to have during other portions of the year. The expense attached to the work of the summer term is usually no greater than for either the first or second semesters.

In a similar manner the professional work in the summer term is conducted in mining and metallurgy. A party of students and their instructors organizes itself and lays out the plans for visiting the various mining camps, mills, reducing works, and other localities of special geologic interest. After the party establishes itself in a particular district, systematic studies of all the details connected with mining methods, the manner of laying out mines, the underground surveys, and the treatment of the ores are taken up in turn before passing on to another district. The same general scheme of practical instruction is followed in the case of the sojourns at smelting works and in the field especially visited for the geological features presented.

Special stress is laid upon the proper keeping of notes. These are fully written up each day. They are made use of later as a basis of other work in connection with the regular courses, besides, if carefully kept, they prove valuable references in later years.

It may be, and in all likelihood will often happen, that the summer field parties in mining, metallurgy, and geology will not be kept intact as a single organization, but that there will be three entirely distinct groups, each having widely different fields of action.

DEPARTMENTS OF INSTRUCTION.

The following departments are now organized and in full operation in the school: Mining, physics, assaying, mechanics, mathematics, ore dressing, modern languages,

mining engineering, mechanical engineering, mineralogy and petrography, geology of mineral deposits, machine design and drafting, electrical engineering, civil engineering, metallurgy, chemistry, biology, geology, English, surveying.

The outlook for the School of Mines for the coming year promises to be the most successful in the history of the institution. Industrially, New Mexico must ever be preeminently a mining State. Moreover, it seems destined to be one of the three great mining States of this country. As such it forms the natural environment of a great mining school, just as similar surroundings have enabled the mining academies of Freiburg, Clausthal, and Prizbrim to attract students of mining from all Europe, and from all the civilized world. To the three States referred to must we look forward for the great mining schools of the Western Hemisphere. A mining school publicly supported has been established in each of these States. That of New Mexico should be in the lead.

In the natural order of events, in a State the paramount interests of which must ever be mining interests, the training of young men to look after those interests has a foremost place in the scheme of public education, but the influence of a great State and a great school within its borders are complimentary and reactionary in character. In a measure the State advertises its great resources of mineral wealth by the position that it gives its mining school. The school does for the State more to develop the mineral resources than is possible by any other means.

Mining to-day is capable of being put on as secure a business foundation as any manufacturing enterprise. From start to finish it may be carried on with the certainty and dispatch of the running of a railroad train or an ocean liner. Lucky "finds" will, however, continue to be made, but henceforward mining as a business will no longer be a vast lottery, ever developing, to their fullest extent, the gambling propensities of mankind.

In this great professional field the mining school marches abreast the schools of law, of medicine, and of divinity.

NEW MEXICO NORMAL UNIVERSITY.

By A. B. SMITH, *Secretary.*

The academic year which closed May 28 was one of the most successful in the history of this institution. Though other years have numbered quite as many students, the quality of the instruction and the spirit among the student body which prevailed the past year has never been surpassed. From the normal course were graduated Pearl Barker, Beulah, N. Mex.; Mattie Barker, Beulah, N. Mex.; Lily G. Johnson, Watrous, N. Mex., and Catherine E. McConnell, Florence, Colo. On these was conferred the degree of bachelor of pedagogy.

The graduates from the academic course were Janette C. Danziger, Cora H. Pettijohn, Harry D. Hoskins, and Edward T. Springer, of Las Vegas, and George W. Degner, of Raton, N. Mex.

The high standard of efficiency set for this institution has been faithfully kept up during the past year, and the board of regents takes pleasure in noting that graduates from the academic course of this school have been received into some of the large universities in the East without examination, and that graduates from the normal course have received recognition for scholarship and professional training by the department of education in other States, and have been eminently successful in the actual work of teaching and school administration.

During the year several lines of permanent improvement have been carried to completion and others have been begun. A fine red sandstone wall 1,100 feet in length has been built around the campus at an expense of $1,800, and on the north side of the campus a cement sidewalk 520 feet long and 5 feet in width has been constructed. The grounds have been brought to grade in accordance with the plans prepared by the landscape architect, and during the present summer they will be seeded with grass. As soon as funds are available the campus will be planted with trees, shrubbery, vines, and flowers, and walks will be constructed from the several entrances of university hall to the adjoining streets.

The original work done by the faculty the last three years, under the auspices of the board of regents, has brought to the normal university a wealth of material for scientific instruction that is the source of no little pride to the institution. Two expeditions in original research in biology and scientific explorations in archeology and anthropology have been made at a total outlay of about $950. The explorations covered the cliff-dwelling regions near Espanola, where a vast amount of pottery, industrial utensils, and other material throwing light on the early civilization of New Mexico was found and made available for academic purposes. The biological

material gathered is no less valuable, and, after being properly classified, has been stored in the normal museum.

The members of the faculty for the coming year are as follows: Edmund J. Vert, Ph. D., Pd. D., president, pedagogy and sociology; Albert S. Otto, M. S., mathematics and physical sciences; Minnie M. Enteman, Ph. D., biological sciences; Myrtle A. Ball, A. M., Latin and English; Joseph Vaeth, Spanish, French, history, civics; Sara Huntsman, English and public speaking; Mareth Furro, music and physical training; S. Stella Henoch, drawing, manual training, and constructive work; Lora Levens, Ph. B., principal of model school, methods of instruction and reviews; Elizabeth F. Remley, grammar grades critic; Anna T. Fitzhugh, primary grades critic; M. Madeline Ve Verka, kindergarten, and instructor in kindergarten theory and practice.

The several members represent some of the leading colleges, universities, industrial and normal schools in this country, and, after careful investigation, have been selected because of their special fitness for their respective positions.

The normal university as organized at present consists of three more or less distinct departments organically related, viz, the normal school proper, the model school, and the academic department.

The aim of the normal school is to give such professional instruction as will enable graduates to carry into their work in the public schools of the Territory the best thought and practices known to pedagogy. This preparation consists, in part, of a thorough knowledge of the academic branches usually taught in the grades and high schools in well-organized city school systems, and of a knowledge of the professional branches, such as educational psychology, philosophy of education, history of education, ethics, methodology, school administration, and others, which enable the teacher to make rational use of the material and forces at hand. The necessities of these two kinds of preparation give rise to the two other departments of the school.

The model school consists of all grades of public school work from the kindergarten through the high school. The pupils composing this school are, for the most part, children of the citizens of Las Vegas who voluntarily patronize the normal.

The normal department offers instruction in the theory of teaching and education in general and the model school affords an opportunity to observe this theory when applied to actual school conditions and training in realizing the aim of education. Student teachers regularly conduct, under the direction of the critic teachers, two recitations daily for a period of one year, to give them skill not only in giving lessons, but also in interesting and managing pupils. The aim is to create as nearly as may be the actual conditions that exist in public schools and to throw the student teacher entirely on his own resources.

The academic department offers instruction in all branches usually taught in secondary schools. On account of the necessity of a thorough knowledge of the subject-matter of instruction as a condition of successful teaching, and on account of the scarcity of high schools in the Territory offering the required amount of work, this department is necessary to a thorough normal course. At present it performs the double function of serving as a model school for secondary grades and as a preparatory school for the normal. It is equipped with chemical, physical, and biological laboratories, and other means of giving instruction in the academic branches in accordance with the most approved modern methods.

The model department has practically all the appointments usually found in such a school. The kindergarten department receives children at 4 years of age, and gives them a year and a half of purely kindergarten instruction and a half year of "transition" work, designed especially to prepare them for the more formal work of the first grade. This department, together with that of the regular grades, manual training, constructive work, and drawing, exemplifies to the student teachers every phase of public school work, and enables them not only to observe such instruction, but actually to give it themselves.

The plan for the future takes full cognizance of the past. The aim is to keep the instruction in all departments entirely within the sphere of a thoroughgoing normal school. Stress is laid on the thoroughness of instruction in the common branches as a preparation for the work that most teachers in the Territory must do in the public schools. In all branches and departments the aim of the teacher is not only to give a certain amount of instruction, but to give careful and systematic training in method of attacking knowledge, thus training the student teachers to do independent thinking, and giving them that mental discipline indispensable to rational teaching.

The second line of emphasis is comprehended in the thoroughness of the professional requirements, including both theory and practice. The professional branches, when comprehended, throw light on all kinds of instruction, and convert the halting empirical work of groping teachers into a course guided at every step by rational

thought. The distinctive feature of a normal school is not the academic course it offers, but the quantity and quality of professional instruction and training it requires as a condition of graduation. The aim is to maintain high standards in all professional instruction, and to develop in our students worthy ideals in all matters pertaining to education and life.

Finance account, 1902.

Balance on hand January 1, 1902	$1,524.13
From Territorial treasurer, maintenance	13,964.13
From Territorial treasurer, refund subscriptions	4,661.19
From tuitions	2,431.04
From special improvement fund, donations	1,102.75
From Mr. David Thomas, donation	500.00
From other sundry donations	260.21
Total	24,443.45

DISBURSEMENTS.

Buildings and grounds	1,185.50
Special improvement fund, grounds	1,647.37
Refund subscriptions	3,346.88
Salaries	14,427.50
General expense and equipment	2,217.18
Balance on hand	1,619.02
Total	24,443.45

NEW MEXICO NORMAL SCHOOL.

By E. M. YOUNG, *Secretary and Treasurer.*

ORGANIZATION.

The board of regents as it is now organized and constituted is as follows: W. G. Ritch, of Engle, president, 1905; E. M. Young, of Silver City, secretary and treasurer, 1908; John Corbett, of Deming, 1906; Percy Wilson, of Silver City, 1907; Robert Black, of Silver City, 1904. The normal, including those in the model school, has a corps of 10 teachers: C. M. Light, principal, teacher of psychology and pedagogy; Hugh A. Owen, departments of natural science and tool work; Sarah Ellis, departments of English and vocal music; Alice R. Bailey, departments of Spanish and mathematics; Edward F. Dunlavy, departments of elocution and history; R. H. Agate, departments of business and art; Anna Ashenfelter, physical culture, instrumental music, and librarian; Jane Langley, principal of model school and conductor of kindergarten; Keturah Swartz and Mary Eckles, assistants in the model school.

TENURE OF OFFICE.

There have been no changes in the personnel of the faculty, except in the addition of three new members: Agate, Ashenfelter, and Eckles. It is the policy of the board to make as few changes as possible consistent with efficient work. We find that a permanency in the tenure of office, as a rule, works for the good of all parties concerned. Teachers when reasonably sure of their positions have an opportunity to work out their ideals and build up their departments in harmony therewith. There is a personal pride in this without which the highest success can not be attained. Then the teacher has a right and the community ought to expect him or her to be a citizen of the Commonwealth, interested in all that pertains to its welfare, to give to its public enterprises, to invest his savings, and to lend his full influence to its betterment. It is thus, and thus only, we believe, that our Territorial institutions can be made to take their place among the honored institutions of the country and to become the most effective in overcoming the illiteracy of our people and in raising them to a higher class of citizenship.

THE YEAR'S SUCCESSES.

The year just closed, 1902-3, has been the most successful in the history of the institution. Though this statement has been appended to every annual report since the school's organization, it is true and peculiarly so for this one. Progress has been

made in every department, and the harmony that has prevailed among students, members of the faculty, and patrons is gratifying to its friends. The enrollment has reached 111 in the normal proper, and 69 in the model school. The alumni of the school now number 63, and 70 per cent of them entered the teaching profession after graduation. During the year a new building, the upper story to be used as a gymnasium and the lower story for manual training and a chemical and physical laboratory, has been erected. More than $700 has been spent for books and apparatus. The campus has been fenced, terraced, roads made, and trees planted. The inside adornment has not been neglected. A number of portraits and a large number of carbon prints of celebrated paintings have been added, the class picture being the most important and costing in the neighborhood of $100; this is the hunting scene of Ruysdael. Some of the others are the Parthenon, the Immaculate Conception, by Murillo, and the Allegorie du Printemps, by Botticelli. Many valuable specimens have been added to the museum; among these are minerals, animal and vegetable products, curios, and manufactured articles from abroad illustrative of the habits and customs of foreigners.

PRESENT FACILITIES.

There are three buildings upon the 20-acre campus, erected at a probable cost of $40,000, and furnish 21 rooms for school purposes. One is devoted exclusively to the training school; another, as explained above, to laboratories and gymnastic purposes; and the main building to general use. The library contains more than 3,500 volumes and the apparatus is valued at about $5,000.

FUTURE PLANS.

Arrangements are being made to furnish two more rooms, one in the training school and one in the main building. The new gymnasium will be furnished as rapidly as our funds will allow. The regents have in contemplation the erection of a dormitory at an early date. Plans and specifications will be submitted for it at their next regular meeting in September.

SCHOOL WORK.

The inward workings of the school have been especially gratifying. Four persons were graduated at the last commencement, two from the teachers' professional course, one from the academic, and one from the kindergarten, this last being the first from the two-year kindergarten department which has been lately established. Besides the regular class work, there have been other features of special merit, programmes of which we append:

Lectures, 1902–3.—Rev. H. W. Ruffner, Titles and Degrees; Mr. Fred A. Bush, What the Community Owes the Newspaper and What the Newspaper Owes the Community; Dr. E. L. Woods, Tuberculosis; Rev. J. R. Gass, Fools; Mr. Eugene Warren, Blood of the Nation; Dr. S. M. Strong, Orthopedics; Hon. S. M. Ashenfelter, Freedom of Effort; Hon. W. T. Cessna, Don't Pay Too Dearly for the Whistle; Dr. O. J. Westlake, The Physician and the Laity; Prof. Wellington Putnam, Rip Van Winkle; Rev. R. G. Harshaw, The Mind's Picture Gallery; Hon. R. M. Turner, Opportunities.

Othello.—For the first time the normal students presented for the class-day exercise a Shakespearean play, Othello. Cast of characters: Othello, E. F. Dunlavy; Iago, Douglas Gifford; Duke of Venice, Charles Harper; Brabantio, Eugene Cosgrove; Cassio, Arnold Rosenfeld; Roderigo, Irvin Moore; Montano, Wilson Porterfield; Lodovico, Henry Geitz; Gratiano, William Fleming; Desdemona, Carrie Whitehill; Emilia, Gussie Rodgers; Paulo, Florence Utter; senators, officers, messengers, and attendants.

Commencement week calendar.—Saturday, May 30, society literary contest; Sunday, May 31, baccalaureate address, Rev. R. G. Harshaw; Monday, June 1, field day; Tuesday evening, June 2, class-day exercises; Wednesday evening, June 3, public reception; Thursday, 10 a. m., June 4, graduating exercises; Thursday, 2 p. m., June 4, alumni luncheon; Thursday evening, June 4, alumni business meeting.

Graduating programme.—Music; the Anglo-Saxon in History, Douglas Gifford; the Anglo-Saxon in Science, Florence Utter; the Anglo-Saxon in Literature, Gussie Rodgers; music; annual address, Hon. R. M. Turner; music; presentation of diplomas.

Doubtless among the most interesting and most profitable events of the institution was the annual society contest between the two societies, the Literati and the Lyceum. The Silver City Commercial Club offered a costly cup to the winning society, and it was won by the Lyceum. The contest was in oration, elocution, debate, parliamentary usage, and athletics.

NEW MEXICO MILITARY INSTITUTE.

By JAMES W. WILLSON, *Superintendent.*

The New Mexico Military Institute has during the past year completed the most successful session in the history of the school. From the first day school opened until the end of the session there was not a vacant room in the cadet quarters; and although 106 cadets were received, many applications for admission had to be refused on account of limited dormitory quarters. The work accomplished has been most satisfactory and gratifying to all concerned; the class work was thorough and covered, in addition to the usual high school course, one year of college work. Great stress was placed on the military duties, and the cadet battalion attained a high degree of proficiency.

During the past session a legislative committee, consisting of Hons. Alex. Bowie, Carl A. Dalies, and A. W. Pollard, visited the institute and made a thorough inspection. In reporting upon the military department they said:

"The cadets presented a neat, clean, trim appearance, quick and firm of step and perfect in military bearing. Every movement of the battalion was executed with the precision of a machine and as if executed by one man, accurately and uniformly, with life and energy displayed in every movement. The result of this training was manifest by the robust, muscular, and healthful appearance of each and every cadet. A feature of the military training is that any one of the cadet officers is capable of commanding a battalion in any military organization, thus giving our Territory the advantage of the service of trained military officers when their services are needed.

"This military training does not interfere with the mental training of the cadets, but, on the contrary, invigorates and quickens the mental faculty by developing the physical stamina of the cadets. We can fully agree with the great educator who said: 'Under a system of military education it would seem that there must be a loss in the time and energy available for the usual academic work. Experience has proven that the very opposite is true. It is seen that the time devoted to military instruction and exercises is more than compensated by the increased mental activity and vigor of the student. His attention is sharpened and his intellect quickened. He is more alert and can acquire more in a given time.'

"We found the whole body of students in good health; not a single cadet was on the sick list. We attribute this desirable condition to the regular hours which they are required to keep and the healthful exercises which they are required to take in the military drills prescribed by the school, and find on further investigation of this feature that the total cost for hospital services, including medical attention and medicine, from April 1, 1898, to March, 1903, was only $1,370.40. This is truly an excellent showing and speaks volumes for the efficient management of the superintendent and his corps of instructors, as well as for the healthful surroundings."

At the close of the session four cadets were awarded diplomas as graduates, and two of them received commissions as lieutenants in the Territorial militia.

As a practical example of the work done by the school, one of its first three graduates, class of 1902, was able to enter the second year or sophomore class at the Massachusetts Institute of Technology, about the best technical school in the country. He entered the class with ease and was prepared in many of the subjects for a higher class. Contending, as we are, against a lack of facilities, we are still able to accomplish good results, and we wish to found and equip further scientific departments, which will give us greater power to train and develop the minds of the students with a practical end in view. We need money to maintain the departments already established and to found others.

A thorough military school is always an expensive one, and especially is this the case in this country. The New Mexico Military Institute has aimed to give to the people of this Territory a regularly disciplined, thoroughly equipped training school for young men and boys, and it has succeeded to a very great extent; but it has reached a point where it should have a larger appropriation in order to hold and continue its work, or it must of necessity stagnate. A school of this class can not stand still. The institute has been and is still growing rapidly, but without money to build more living quarters and equip further scientific departments it will begin to decline. We wish to maintain this school in its position as one of the very best in the Southwest, and we view with dismay the possibility of its either standing still or declining.

At the beginning of the past session the demand for admission became so great that the regents decided to erect a new 10-room building in addition to cutting off four comfortable living rooms in the gymnasium.

These together furnished additional quarters for 28 cadets. The new building was designed and constructed in such a way that it may be used as a wing of the barracks building which we hope to erect as soon as the bond issue granted the school

by the thirty-fourth legislative assembly is approved by Congress. It is the policy of the school to make all improvements substantial and permanent, and the new building was erected with that end in view, at a cost of $2,300.

The property of the institute consists of 40 acres of land, all under fence, 10 acres of which are irrigated, set in grass and planted with trees, making beautiful parade grounds and campus. The town is building very rapidly in the direction of the school and has entirely surrounded it. Naturally the property is becoming very valuable. The buildings consist of the large 4-story brick structure described in our former reports and four substantial frame buildings. There has never been any special appropriation for the construction of these buildings; but as the school was obliged to have them, we used part of the money appropriated for current expenses and by the hardest efforts managed to earn money with which to run the school.

During the past year the institute has put in a system of waterworks at a cost of $3,563.58. The system consists of an artesian well 290 feet deep, located at the bottom of the hill 1,700 feet south of the institute, and is cased with 8-inch casing. The well gushes 17 feet above the ground and furnishes power to operate a No. 80 ram, which is connected by 5-inch galvanized-iron pipe with the 10,000-gallon tank, the same formerly filled by the steam pump. The tank is 60 feet above the foundation of the main building, and has pressure enough to throw water on top of any of the buildings. The ram forces water onto the grounds at the rate of 120 gallons per minute and supplies all the water needed. This is a great saving, as the old system required the running of the engine nearly every day, and the expense in fuel and attention was great. Since our last report we have also had the main building partially replastered and painted throughout. We have fenced the entire grounds and erected a large storeroom and stable.

Following is the table of receipts and disbursements from June 30, 1902, to June 30, 1903. All original bills are required to be itemized and receipted, are carefully filed and preserved, and are subject to inspection at any time.

RECEIPTS.

Balance on hand, land sales and leases fund, June 30, 1902	$812.83
Balance on hand, levy fund, June 30, 1902	346.89
Balance on hand, tuition fund, June 30, 1902	72.41
Received from Territorial auditor from June 30, 1902, to June 30, 1903, levy proceeds	9,751.73
Received for board and tuition from June 30, 1902, to June 30, 1903	17,830.00
Total receipts	28,813.86

DISBURSEMENTS.

Maintenance and supplies:		
Advertising	$198.30	
Athletic supplies	142.30	
Commissary	6,356.45	
Expense	812.75	
Fuel	1,208.80	
Hospital	197.72	
Insurance	217.50	
Laboratory	57.48	
Laundry	1,495.48	
Light	530.30	
Military supplies	137.07	
Office	489.59	
Repairs	351.26	
Salaries	5,808.15	
Stable	294.16	
Wages	2,562.05	
		$20,859.36
Property:		
Buildings	2,558.60	
Fencing	12.10	
Furniture and fixtures	553.61	
Improvements	268.63	
Library	14.65	
Movables	305.00	
Tools	21.85	
Waterworks	1,838.38	
		5,572.82

Balance on hand, land sales and leases fund, June 30, 1903	$4.38
Balance on hand, levy fund, June 30, 1903	12.57
Balance on hand, tuition fund, June 30, 1903	2,364.73
Total	28,813.86

NEW MEXICO ASYLUM FOR THE DEAF AND DUMB.

By FRANCISCO DELGADO, *Secretary and Treasurer.*

The trustees of the New Mexico Asylum for the Deaf and Dumb are unable to report any specific work accomplished during the fiscal year ending June 30, 1903, beyond the advance made toward the completion of the building now being built for the future use of the school, to the extent provided for in the present contract, which covers only the finishing of the first floor and the stairways to the second and third floors. That contract, by its terms, required such completion by August 15, 1902, over a year ago, but the delay in supplying the brick, as claimed by the contractor, prevented the completion of the walls before the approach of winter, when the cold weather delayed the work till spring. The work under the contract is now about completed, and it is the intention of the board to at once contract for the finishing of such additional parts of the building as may be necessary for its use, and also to contract for the requisite furniture and equipments. To do this it is thought that the board will postpone opening the school until next year and use all the funds, both permanent and for maintenance, in finishing, furnishing, and equipping the building to the extent above stated, although this action has not yet been positively decided on.

No school has been held for the past two fiscal years because there was no appropriation nor tax levy made for that purpose by the legislature of 1901. The legislature of 1903 made a deficiency appropriation of $800 for the balance of the present Territorial fiscal year and a tax levy of one-tenth of 1 mill for each of the coming two fiscal years.

It is believed that some time during the coming calendar year the board will be able to open the school in the new building under favorable conditions, and that thenceforth ample provision can be made for the training and education of all the deaf mutes of the Territory who may apply.

REPORT OF NEW MEXICO INSANE ASYLUM.

By JEFFERSON RAYNOLDS, *President.*

Number of patients in asylum May 31, 1902		111
Admissions for the year		30
Total number treated		141
Recovered	13	
Improved	2	
Died	18	
		33
Number of patients remaining in the asylum May 31, 1903		108

The percentage of recoveries, based on admissions for the period, was 39.3 per cent.
The percentage of deaths, based on the total number treated, was 12.7 per cent.

Average attendance for the year	109
Number of meals furnished patients	119,355
Cost of food supplies	$5,819.37
Average cost food supplies, each patient—	
Year	54.30
Month	4.525
Week	1.041
Day	.1488
Meal	.0496
Total actual expense for maintenance for year	26,508.06
Average expense, each patient—	
Year	243.19
Month	20.265
Week	4.654
Day	.6663
Meal	.2221

It is gratifying to note such a flattering percentage of recoveries based on admissions for the year, though the asylum is rapidly becoming filled with chronic and incurable cases. In such an institution there certainly can be no doubt but that the acute or curable cases should have preference over the chronic or incurable ones, but under the law as now framed the medical superintendent and board have no discretion whatever, and the result is that we have but little room for any class of patients, the greater number now in the asylum being incurable, and in all probability will remain there until relieved by death. There is a pressing need of a separate building for the female patients, which becomes more insistent from year to year. With this provided for, the male patients would occupy all of the present building, and probably some years would elapse before further enlargement would be necessary. It would be more in conformity with other like institutions throughout the country and more appropriate if the sexes were kept in separate buildings. We are informed by our medical superintendent and others that there are many cases now confined in damp, dark cells of county jails, with no ventilation, filthy, and eaten by vermin, which are acute. By transferring these patients to the asylum, with proper care and treatment they could perhaps be cured and many of them discharged. Otherwise they become chronic cases and permanent charges on the Territory. This institution stands on a basis occupied by no other in the Territory. It should not be made a refuge for the chronic and incurable cases only, placing them where they enjoy good clothing, fresh air and sunshine, abundant food, and the care their demented condition demands—a tax upon the Territory as long as they live—but it has a higher purpose, viz, to take the recent or acute cases, treat them scientifically, and restore them to sanity. Only a small number of acute cases have been admitted, for the

capacity of the institution has been taxed with those that have become chronic waiting in the jails until there was a vacancy by death. The failure of the passage of the bill by Congress authorizing us to sell our public lands or issue bonds secured by the same has defeated our plans for the welfare of the public and the care of the insane people of the Territory. This is a crying necessity, and $100,000 judiciously expended would accommodate all the insane people of the Territory. Inasmuch as the whole Territory would be greatly benefited by the proper treatment of the insane, we respectfully request that some means be provided whereby our lands may be made available for this purpose. No worse policy can be pursued than making incurables by delay.

The management believes it beneficial in body and mind that the patients should engage in labor to a limited extent, the amount performed and the time devoted to it depending entirely upon the condition and desire of the patient. They are not compelled to work and are not permitted to do so to the extent of fatigue or when not in proper physical condition. The patients look upon work as a privilege, they enjoy it, and are happier when assigned to any duty. Over 65 per cent of the patients do something toward their own maintenance. The importance of some recreation is not overlooked, and twice a month a dance is given in the dining room of the female department, to which all the patients in fit condition are invited. Other amusements are furnished at intervals.

We wish to thank you for the appointment of the ex parte scientific commission for the investigation of the malicious charges brought against the management of the asylum, the report of which is now in your hands.

REPORT OF THE NEW MEXICO PENITENTIARY.

By H. O. BURSUM, *Superintendent.*

During the past year we have had an average of about 235 convicts, all of whom have been kept continuously employed in the manufacture of brick for public use and sale; the construction of a wagon road, known as the "Scenic Route," from Santa Fe to Las Vegas; quarrying and burning of lime rock for public use and sale; manufacture of clothing and shoes, etc., for penitentiary use; construction of new buildings for penitentiary; gardening, etc., and various other purposes.

The discipline has been entirely satisfactory, and but one escape occurred, which was made from the Scenic Route by a short-term prisoner, whom we expect to recapture. The health of the prisoners is exceptionally good.

Financial statement from December 1, 1902, to June 30, 1903.

GENERAL MAINTENANCE FUND.

To amount received from apportionments	$22,796.11
To amount received from transfer	5,000.00
Total	27,796.11
By disbursements	27,480.26
Balance June 30	315.85

PENITENTIARY SALARY FUND.

To amount received from apportionments	$8,152.24
By disbursements	6,244.91
Balance June 30	1,907.33

CONVICTS' EARNINGS FUND.

To amount paid treasurer by H. O. Bursum	$7,590.80
By disbursements	7,085.63
Balance June 30	505.17

PENITENTIARY PERMANENT IMPROVEMENT FUND.

To amount received from apportionments	$5,559.89
By disbursements	3,253.13
Balance June 30	2,306.76

PENITENTIARY INCOME FUND.

To amount received from apportionments	$94.26
By disbursements	93.97
Balance June 30	.29

PENITENTIARY COMMISSIONERS' FUND.

To amount received from apportionments	$1,244.72
By disbursements	557.40
Balance June 30	687.32

THE BRICK-MAKING PLANT AT THE NEW MEXICO PENITENTIARY AT SANTA FE.

RECAPITULATION.

Received to all funds as follows:	
General maintenance fund	$27,796.11
Penitentiary salary fund	8,152.24
Paid treasurer by H. O. Bursum	7,590.80
Penitentiary permanent improvement fund	5,559.89
Penitentiary income fund	94.26
Penitentiary commissioner's fund	1,244.72
Total	50,438.02
Disbursed from all funds as follows:	
General maintenance fund	27,480.26
Penitentiary salary fund	6,244.91
Convicts' earnings fund	7,085.63
Penitentiary permanent improvement fund	3,253.13
Penitentiary income fund	93.97
Penitentiary commissioner's fund	557.40
Total	44,715.30
To balance June 30	5,722.72

RULES REGULATING APPLICATIONS FOR PARDONS, RESPITES, AND REPRIEVES IN NEW MEXICO.

Pardons, which it has been customary to grant on New Year's Day, Christmas Day, Thanksgiving Day, and the Fourth of July are not subject to the following rules, but are granted solely as a matter of grace to deserving inmates of the penitentiary, and only upon the recommendation of the superintendent and the board of penitentiary commissioners, to those who have served a long term without violating any of the rules and regulations of the institution, and whose general conduct has been exemplary:

Rule I. All applications for pardon must be addressed to the governor of New Mexico in writing and must be signed by two or more credible persons, residents of the county wherein the crime was committed, giving the post-office address of each signer.

Rule II. The application must state the name of the convict, his age, where born, in what court and term he was tried and the crime for which he was convicted and for what term he was sentenced, and fully the grounds upon which the pardon is asked. It is not necessary to furnish copy of the indictment or other court papers.

Rule III. No application for pardon will be considered unless the judge of the court and the prosecuting attorney for the district where the trial took place shall recommend that the pardon be granted, and in case the ground for pardon is the ill health or physical condition of the convict, a certificate to that effect and recommendation for the pardon must be obtained from the penitentiary physician.

Rule IV. Applications for pardon will not be considered pending appeals from judgments of conviction, nor before the convict shall have been actually incarcerated in the penitentiary, nor unless the prison record of the convict has been good, which must be certified by the superintendent.

Rule V. Applications with accompanying papers can not be withdrawn after they have been presented to the governor, as they become part of the records of his office. Copies, however, may be furnished to the applicant at his expense.

Rule VI. Applications should be accompanied by the recommendations of as many of the trial jury as possible, in addition to the recommendation of the judge and prosecuting attorney, which latter are absolutely necessary.

Rule VII. Applications for respite, reprieve, or commutation of sentence must conform substantially to the above rules relating to applications for pardon.

Rule VIII. All applications conforming to the above rules will be promptly considered and acted upon by the executive, and the applicant notified of the result.

Personal letters or interviews by the applicant, his friends, relatives, or attorneys will be of no avail, as the granting of a pardon is an executive act which must be based upon the records and files in the executive office.

The governor can not grant pardons for offenses against the United States.

MIGUEL A. OTERO,
Governor of New Mexico.

August 3, 1903.

REPORT OF THE BOARD OF EQUALIZATION.

By VENCESLAO JARAMILLO, *Secretary.*

The board has held its regular semiannual meetings, as provided by law, in January and September, and has endeavored to equitably adjust the taxes complained of, but in the very outset it met with the difficulty that it can only act in cases where proper appeals are taken from the different boards of county commissioners. We herewith submit counties showing increase of assessed valuation subject to tax, for the year 1902, as follows:

Luna	$112,265.00	Taos	$179,088.00
Sierra	153,065.65	Socorro	37,290.00
Otero	161,122.37	Mora	18,393.00
San Miguel	562,428.00	Doña Ana	77,856.00
Santa Fe	229,319.00	San Juan	537.00
Union	61,327.00	Eddy	200,329.00
Chaves	193,078.00	Rio Arriba	43,012.00
Colfax	84,772.00	Guadalupe	212,051.40

The following counties show a decrease:

Valencia	$38,889.89
Lincoln	2,419.00
Grant	281,692.00
McKinley	221,722.00
Bernalillo	124,265.00

By investigation it will be seen that valuations in different counties on the same classes of property, other than lands, differ widely; for instance, referring to horses, Bernalillo County returns 1,200 head, at only $5 per head, while San Miguel returns 3,889 head, at $15—more than three times as many at three times the valuation.

The tax rolls furnished to the board by the auditor are in such an incomplete condition as to be of very little service to the board. Out of 21 counties only 4 returned rolls correctly compiled, accompanied by abstracts, as required by law, and in some cases the abstracts were omitted entirely. It is a lamentable fact that several of the larger counties seem to vie with each other in reducing their present very inadequate assessments. This is done, no doubt, primarily to avoid their just share of Territorial tax, and while many of the smaller counties make fair assessments and pay their full proportion of Territorial tax, this condition is an injustice to them.

While it is a little bit early to know exactly how much good the law passed by the last legislature, giving increased powers to the board of equalization, and also the law creating the traveling auditor, will accomplish, it can safely be said that it will amount to a great deal of good to the taxpayers of the Territory, and that it will furnish the means by which the equalization of taxes can be more justly apportioned.

The traveling auditor will undoubtedly be of great help to this board, as he will be able to furnish the data which is very often asked for by the members of the board to the different county assessors. When we meet here on the second Monday of September we will be able to tell more fully the workings of these two new laws.

The following are the assessments, by counties, for 1903, showing a decided improvement and increase, the figures, however, being subject to slight corrections:

San Miguel County leads in taxable valuation, the total assessment being $4,732,436. Bernalillo County is second, with a valuation of $3,103,120. Colfax, Chaves, and Grant come next in the order named, their assessed valuation being, respectively, $2,981,411, $2,939,012, and $2,912,977. Other counties whose assessed valuation is above $2,000,000 are the following: Santa Fe, $2,207,842; Doña Ana, $2,189,899; Socorro, $2,086,610; Union, $2,021,640. The counties whose assessed valuation exceeds $1,000,000 are Eddy, $1,937,914; Otero, $1,570,864; Luna, $1,502,692; Valencia, $1,359,786; Lincoln, $1,348,802; Sierra, $1,326,920; Mora, $1,175,823. Then come Rio Arriba, $981,656; McKinley, $968,107; Leonard Wood,

$923,017; Sandoval, $792,565; Quay, $762,998; San Juan, $679,491; Taos, $677,820; Roosevelt, $649,164.

The total assessed valuation of the Territory according to the above figures is $41,832,566.79, a gain over last year of $723,821.72. However, the actual gain in assessment, subject to taxation, is almost $3,000,000, owing to the elimination of double assessments and a decrease in exemptions in several counties. Ten counties show a loss in assessment, partly accounted for by the loss of territory toward the creation of new counties, while 11 counties show gains in assessed valuation.

REPORT OF THE COMMISSION OF IRRIGATION.

By GEORGE W. KNAEBEL, *Secretary.*

Of the lands granted by act of Congress approved June 21, 1898, for the establishment of permanent water reservoirs, etc., the commission has approved contracts involving about 100,000 acres of land, and applications are pending involving an additional 100,000 acres. In order to obtain sufficient revenue to comply with the requirements of section 15 of chapter 69 of the session laws of 1901 of the Territory, which makes it "the duty" of this commission "to investigate and select the most suitable sites for permanent reservoirs for irrigating purposes and for the improvement of the Rio Grande, and also to designate such tracts of public land capable of irrigation from such reservoirs as it would, 'in the opinion of this commission,' be advisable to locate and select for the Territory under said act of Congress in order to secure the enhanced value of the lands resulting from the establishment and construction of such reservoirs, for which purpose 'this commission' may employ all necessary expert assistants," the commission concluded unanimously to approve of contracts by the commissioner of public lands, to grant rights of pasturage on first-class grazing and agricultural lands for a period not exceeding five years, and at an annual charge of 4 cents per acre; and also to approve of the sale of 25,000 acres of land at a price of not less than $2 per acre plus the costs of selection, such lands to be sold at public auction, upon due notice, to the highest bidder.

Fifty thousand acres of arid lands have been reserved by the commission under an expected contract for the reclamation thereof by means of artesian water, and 50,000 acres have been reserved for sale and for reservoir enterprises, and the remaining 300,000 acres, including 100,000 granted under the said act of Congress for the improvement of the Rio Grande, have been reserved by the commission for applicants under said rights of pasturage, all of such reservation having been applied for and requisition made for its selection upon the United States land commission.

It is the purpose of the commission of irrigation, just as soon as sufficient revenue accrues from said pasturage rights and sale of lands within its jurisdiction, to employ a thoroughly competent engineer and all expert assistants necessary, as provided in said laws of 1901, "to investigate and select the most suitable sites for permanent water reservoirs and for the improvement of the Rio Grande," etc., and in this manner to gather scientific and reliable data for the information of all parties who, with such information, would engage in the business of establishing such reservoirs, and particularly for submission to the Honorable Secretary of the Interior, to the end that New Mexico may receive its just share of the benefits under the act of Congress, approved June 17, 1902, entitled "An act appropriating the receipts from the sale and disposal of public lands in certain States and Territories to the construction of irrigation works for the reclamation of arid lands." There are several excellent reservoir sites in New Mexico, and when they are submitted to the honorable Secretary of the Interior, together with the data above mentioned, it is expected due attention will be given by that United States official, and New Mexico will be greatly benefited thereby.

AN IRRIGATION CANAL ON THE ARID PLAINS.

REPORT OF THE CATTLE SANITARY BOARD.

By J. A. LaRue, *Secretary.*

The drought prevailing throughout the Territory at the close of the fiscal year ending June 30, 1902, continued until late in August, when it was greatly relieved by rains commencing in the southern and southwestern counties and continuing through September, causing a vigorous growth and the early maturity of grass and herbage of all kinds fed upon by cattle; by the end of October they were in condition to be handled. A strong demand came from California, and all that transportation could be furnished for were disposed of to be sent in that direction at fairly satisfactory prices. Though rains came later in the northern part of the Territory they were not well distributed nor heavy enough to furnish much water. Grass made some growth, but, in the opinion of old cattlemen, not enough matured to make a sufficient supply of feed for all the stock on the range through the winter, and such as could be disposed of were sent to market and others were shipped out to pasture where pasture could be found. Owing to these precautions the actual loss by death was very light in comparison with what had been feared, and range men have renewed confidence in the staying qualities of the old cow.

Abundant rains set in much earlier than usual in the spring of 1903, and though it was too cold to give much start to vegetation it put water out on the plains in every depression and made it possible for cattle to go out and graze on those portions of the range where no permanent water is found, and for that reason had not been closely grazed for years. In the meantime some little new grass was springing up through the old, and a great improvement in their condition was apparent in a few days. They have gotten through without much loss; good rains have since been well distributed and range stock of all kinds are doing well.

The effect of the floods on the section to which this Territory has heretofore been tributary has been such that no calculation may safely be made as to the demand for cattle to feed from that section, nor can be until the belated crops are safely in hand. Fortunately the conditions on the Pacific coast are such that a great many cattle can be handled, and an outlet for a great many of them is promised in that direction, and there is good reason to believe that the demand will increase to immense proportions as the trade to the Orient develops.

The investigation for Texas fever infection in the quarantined districts of Grant and Luna counties, N. Mex., mentioned in my last report, was continued under the supervision of the now Territorial veterinarian until early in February of this year, and nothing more than the one cow on which six fever ticks were found in May, 1902, has ever been seen. This investigation has been supplemented by an examination conducted by Dr. L. J. Allen, inspector for the Bureau of Animal Industry, who reported to his chief, Dr. D. E. Salmon, that he had found no evidence of Texas fever infection. This in May of this year; and on May 25, last, with the consent of the Bureau of Animal Industry, the quarantine was raised. In the meantime a sanitary fence 10 miles long, closing the passes leading through the mountains into New Mexico from the infected districts, has been erected and is now being duly patrolled.

In common with all other Western States and Territories, New Mexico has a few herds infected with scabies, mange, or Texas itch, which though not generally fatal, the cattle affected by it become very much emaciated and lose all merchantable value. The Territorial veterinarian is now out in the field locating the infected herds and giving directions for their immediate treatment. The most vigorous measures are being taken to eradicate it. No infected animals will be permitted to come in contact with noninfected herds or to be taken out of the Territory until they have been treated for the disease, and are declared to be clean and are released by an inspector for the Bureau of Animal Industry or by the Territorial veterinarian. This order of the board will be rigidly enforced until the disease is thoroughly stamped out within the limits of this Territory.

Several thousand head of cattle were sent last year from northwestern Texas and

southeastern New Mexico to the British possessions north of the United States, it having been claimed that great advantages of rich pastures, cheaply procured, might there be obtained. No reliable data of the results of this experiment has yet been received, but it is not believed that the expectations entertained have been fully realized. The results of another experiment for the cheap production of meats by the feeding of cassava roots, which can be produced in the Gulf States from the Atlantic Ocean to Mexico, has just been reported to be crowned with complete success. Beginning with poor cows, a gain of over 60 per cent in weight was made in seventy-five days, and the cost of the live weight produced by feeding cassava root was 1 cent per pound and the profit made in fattening was 59.1 per cent. This, if true, and there is good reason to believe it is, as the experiment was carefully made, beats the Canada proposition and creates a home market for southern cattle.

The increase on the range as so far reported has been about 70 per cent, and with the exception of the loss of some early calves in Chaves and Eddy counties all are doing well. An abundance of feed is reported from all sections, though getting a little dry in some spots. The depredations of wild animals have not increased, though in the spring and early summer they destroy a good many calves. The large gray wolves, now that the buffalo have gone, prey on the young of all range stock; that they are not perceptibly increasing is owing to continual vigilance of individual cattlemen for their extirpation from their ranges. No concerted movement seems to have been effective. Many believe that a quiet hunt about their lairs during their breeding season gives better results.

During the year ending June 30, 1903, 184,602 cattle, 5,526 horses, and 17,275 hides have been inspected for removal from the Territory, and 14,315 cattle have been brought in for pasturage and breeding purposes.

ON A CATTLE RANCH NEAR ROSWELL—FOUR FULL-BLOOD BULLS.

REPORT OF THE SHEEP SANITARY BOARD.

By Solomon Luna, *President.*

In the latter part of June, 1902, the following general instructions were sent to all our inspectors who are not continuously employed on salaries:

"Complaint has been made that the Territorial sanitary board inspectors do not keep as careful watch for scabby sheep as they should. This opinion should not exist.

"The sanitary board instructs you that when complaint is made, or that you learn in any manner that any flock or flocks of sheep have scab, you will immediately quarantine such flock or flocks of sheep, notify the owner that the same have been quarantined, and that he must at once have such sheep dipped twice, ten days between dippings, and until the same are clean of scab. Upon his failure to so dip within ten days after such notification, take charge of the sheep, impose a fine of 1 cent per head, notify the board promptly of action taken, employ necessary help and dip the sheep until they are clean of scab. Send bills for expenses incurred to the board, with amount of fine imposed, and the same will be collected from the owner of the sheep by suit if necessary. Hold the sheep in your charge until authorized to release the same by the board. All fines when collected to be sent to the board to be credited to the inspector imposing the same, and to be paid to that inspector at the first meeting of the board after collection is made.

"The sheep sanitary board desires these instructions to be strictly followed, and all our inspectors will be backed up in any action they may take under such instructions. Any failure on the part of an inspector to carry out the same will be followed by an immediate request for his resignation. What the sanitary board desires is that the scab be stamped out of this Territory, and we only want inspectors who are willing to follow instructions of the board, quarantine sheep when scabby, and impose fines.

"You are also ordered to notify all growers in your district that all sheep must be dipped at least once between now and the 1st day of November. This applies to sheep which are not scabby, instructions as to scabby sheep are given above. A failure on the part of an owner to comply with this order to dip between now and the 1st of November, will be followed by an imposition of a fine of 1 cent per head.

"These instructions to be in force until further orders."

A severe drougth had prevailed for several months previous to the giving of these instructions, which continued unbroken until later in the summer. When the rainy season finally commenced, a vigorous fight against scab was resumed and the above instructions strictly carried out. All scabby sheep were ordered dipped twice, ten days between dippings, or until clean of scab.

In the early winter all sheep in the Territory were ordered dipped, and our inspectors made reports on each flock. The drought which had prevailed during the spring and summer lasted until so late that the grass in many sections did not have time to grow and mature. Heavy snows prevailed throughout the Territory during the winter, and in sections where there was but little grass the losses were large.

Our shipping inspectors have carefully inspected for scab every lot of sheep leaving the Territory, and when an infected flock was found it was held in quarantine and the sheep dipped once or twice, when necessary, until they were free of scab. A report of each shipment was made to the board, which report is kept on file in the office of the board.

An act of Congress was passed in January, 1903, providing for Federal inspection of interstate shipment of live stock, and that such inspection by an inspector of the Bureau of Animal Industry shall be sufficient without further inspection. Under this act inspectors of the sheep sanitary board would not have authority to make inspections of sheep shipped into or out of the Territory when they have been inspected and have a certificate of health from an inspector of the Bureau of Animal Industry. This board prepared an act amending the laws of the Territory to conform with the act of Congress, which was passed by the legislature in March,

and became a law. By this act it is provided that inspectors of this board shall continue to make inspections as to ear marks and brands, examine bills of sale, and report to the board the name of shipper, destination, number of sheep shipped, date of shipment, earmarks and brands; etc., and substance of bills of sale, which report shall remain on file in the office of the board. No sheep will be allowed to be shipped out unless the shipper raised said sheep or has bills of sale for same, or authority in writing, and no sheep with illegal marks shall be shipped out without special permission from the board.

By this act the board is given authority to fix the levy for sheep sanitary purposes upon the assessed value of sheep, which will enable the board so to increase the fund at its disposal as may be deemed necessary, and to employ additional salaried inspectors and thus accomplish a great deal more in the future than it has in the past.

The board has now three salaried inspectors continuously employed and they are rapidly cleaning the districts over which they have charge of scab among the sheep. In addition to these three inspectors the board has a corps of 30 range and shipping inspectors. The range inspectors are constantly on the watch for scabby sheep with full authority to quarantine and order the sheep dipped, or take charge of the flock and dip them when their orders are not complied with. By said act the board is also given authority to impose fines when sheep have scab and to collect such fine by suit when necessary.

This spring was remarkably cold and grass in many sections very late, and there was consequently a comparatively poor lambing. The per cent of lambs saved, however, varied in different sections from very bad to extra good.

During the first half of June rains were general throughout the Territory and there is now plenty of water and grass. Scabby sheep have been quarantined by our inspectors and their owners are dipping them under the directions of said inspectors.

During the previous year the board sent out in both English and Spanish a large number of pamphlets setting forth instructions as to preparation and use of sheep dips, said directions having been prepared under the supervision of the Bureau of Animal Industry, and the board urged upon the sheep growers of this territory that they provide themselves with the necessary facilities for dipping their own sheep and that they carefully study these directions and dip their sheep in accordance therewith. This pamphlet is still constantly in demand and undoubtedly has been of great benefit.

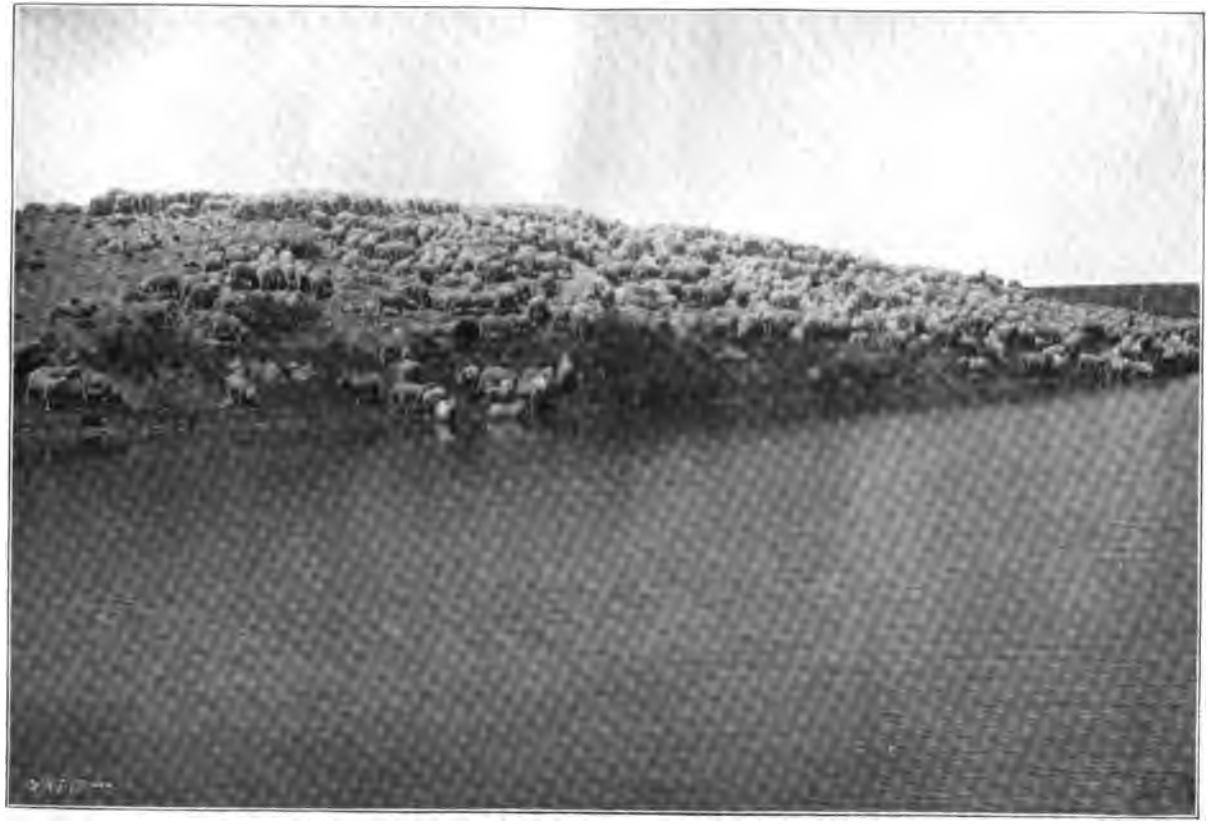
The membership of the board was increased by the act heretofore referred to from three to five, thus decreasing the extent of the territory over which each member has direct charge and greatly increasing the value and efficiency of the board.

Conditions for the stamping out of scab in New Mexico are much better than ever before and the board feels well pleased and satisfied with the improved prospect.

The number of sheep which left the Territory in the time covered by this report is 422,252.

The number brought in during the same period is 32,394.

The estimated number of sheep in the Territory immediately before lambing, taken from data in the office of the board, was 3,300,000.



SHEEP WATERING IN THE NORTH SPRING RIVER NEAR ROSWELL.

New Mexico has between 5,000,000 and 6,000,000 sheep.

REPORT OF THE BOARD OF LOUISIANA PURCHASE EXPOSITION MANAGERS.

By W. B. WALTON, *Secretary.*

The act of the thirty-fifth legislative assembly creating the Territorial board of Louisiana Purchase Exposition managers of New Mexico demonstrated the desire of the people of this Territory to have a creditable exhibit at the Louisiana Purchase Exposition at St. Louis in 1904. A similar board had been created by the thirty-fourth assembly, but at the recent legislative session a clause providing for the repeal of the former act was inserted in the appropriation bill and became law, owing to the inadvisability of attempting to change a measure of such general importance and affecting so many conflicting interests. As soon as this action became known there was a demand from all over the Territory that provision be made at once to continue the work of collecting and preparing an exhibit, and the result was the passage of the bill providing for the present board on March 19, 1903. The new act was drafted on the same lines as the former one with a few minor changes, and carried an appropriation not to exceed $30,000, the same to be raised by levy.

Pursuant to the authority contained in the act, Governor Miguel A. Otero on May 18, 1903, named the following as members of said board: Charles A. Spiess and Eusebio Chacon, of Las Vegas; Fayette A. Jones, of Albuquerque; Arthur Seligman, of Santa Fe; Carl A. Dalies, of Belen; Herbert J. Hagerman, of Roswell, and W. B. Walton, of Silver City. The organization of the board was perfected June 1, 1903, by the selection of these officers: Charles A. Spiess, president; Carl A. Dalies, vice-president; W. B. Walton, secretary; Arthur Seligman, treasurer.

Since its organization the board has been holding meetings on an average of once a month, and, considering the comparatively short time that it has been in existence, excellent progress is being made in the preparation of the New Mexico exhibit, warranting the statement that the showing will be altogether creditable.

Arrangements have made for the erection of a New Mexico building at St. Louis at a cost not to exceed $5,000, the expenditure for such purpose being necessarily small on account of the limited appropriation. The building will be of the Spanish mission style, neat and attractive in appearance, and will be conveniently fitted up for the accommodation of visitors. The work of collecting a comprehensive display of our wonderful resources is well under way throughout the Territory, and the people of the different counties are taking commendable interest in assisting the board by local effort. The mining industry will be fully illustrated, and the magnificent products of our farms, forests, and stock ranges will be intelligently shown. The educational exhibit gives every promise of being an exceptionally good one, and one which will furnish an idea of the great strides which New Mexico is making in educational advancement.

It is the policy of the board to make "the New Mexico of to-day" the guiding feature of the exhibit. The time has passed for exhibitions that will lead people to suppose New Mexico is still inhabited mainly by a race who wear Navajo blankets, use bows and arrows, and whose chief earthly possessions are highly colored pottery and quaint baskets. It is the endeavor of the board to set forth as clearly as possible what New Mexico has done in development, its progress, its resources, and what it actually is at this time. The New Mexico exhibit will be essentially for the purpose of showing the desirability of the Territory for homes or investment and to attract people here to remain permanently; not for the curiosity seeker. The archæological and historical phases will not be neglected, but they will not be made the leading features, as has been done heretofore.

REPORT OF THE BUREAU OF IMMIGRATION.

By MAX. FROST, *Secretary.*

During the sessions of the thirty-fifth legislative assembly in March the following citizens of New Mexico were appointed, according to law, members of the bureau of immigration for the term of two years, and were duly confirmed by the legislative council: Granville Pendleton, Aztec, San Juan County, first district; Alfred Grunsfeld, Albuquerque, Bernalillo County, second district; Joseph W. Bible, Hanover, Grant County, third district; William B. Bunker, Las Vegas, San Miguel County, fourth district; Jose E. Torres, Socorro, Socorro County, fifth district.

These appointees qualified according to law and met in annual session, as prescribed by law, at the office of the bureau of immigration, in the city of Santa Fe, on the second Monday in April, 1903, and organized as follows:

W. B. Bunker was elected president; Granville Pendleton, vice-president; Joseph W. Bible, treasurer. Max. Frost was unanimously reelected as secretary of the bureau.

The bureau is nonpartisan in character, three of its members being Republican in politics and two being Democrats.

The operations of the bureau during the past year have been extensive, and the amount of labor performed has been much greater than during the year 1901–2. The correspondence of the bureau has greatly increased, and the applications for literature published by the bureau giving information concerning the conditions, resources, and climate of New Mexico have also been constantly augmented.

During the year for which this report is made the following bulletins and pamphlets have been published by the bureau:

The County of Bernalillo, 5,000 copies, illustrated; the County of Chaves, 10,000 copies, illustrated; the County of Colfax, 10,000 copies, 5,000 not illustrated and the second edition of 5,000 illustrated, revised, and enlarged; the County of Doña Ana, 5,000 copies, illustrated; the County of Eddy, 5,000 copies, illustrated; the County of Grant, 5,000 copies, illustrated; the County of Guadalupe, 5,000 copies, illustrated; the County of Lincoln, 5,000 copies, illustrated; the County of Luna, 5,000 copies, illustrated; the County of McKinley, 5,000 copies, not illustrated; the County of Mora, 5,000 copies, illustrated; the County of Otero, 5,000 copies, illustrated; the County of Rio Arriba, 5,000 copies, not illustrated; the County of San Juan, 5,000 copies not illustrated and 10,000 copies illustrated; the County of San Miguel, 10,000 copies, illustrated; the County of Santa Fe, 5,000 copies not illustrated and 8,000 copies illustrated; the County of Sierra, 5,000 copies, illustrated; the County of Socorro, 5,000 copies, illustrated; the County of Taos, 5,000 copies, not illustrated; the County of Union, 5,000 copies, illustrated; the County of Valencia, 5,000 copies, illustrated, making a total of 138,000 copies. It is found that the greatest demand is for bulletins upon the following counties: San Juan, Santa Fe, Chaves, Colfax, Socorro, Luna, Otero, Eddy, Leonard Wood, Quay, Lincoln, and Roosevelt.

Of these bureau publications the editions on Bernalillo, Chaves, Doña Ana, Eddy, Luna, and Socorro are nearly exhausted and reprints of the revised and enlarged editions of the publications are necessary. The bulletins above named have been distributed through the agencies of the passenger departments of the Atchison, Topeka and Santa Fe Railway, of the El Paso and Northeastern Railroad, the Denver and Rio Grande Railroad, the Santa Fe Central Railway, and the Chicago, Rock Island and Pacific Railroad. These roads have rendered this bureau most timely and efficient aid in this matter. Thousands of copies of these bulletins have been sent out by the bureau and many others have been distributed by leading citizens in different sections of the Territory, as also by irrigation companies, mining companies, boards of trade, commercial clubs, and similar organizations. Many complimentary letters have been received during the past year upon the work of the bureau, the preparation of these pamphlets, their neat appearance, their handy size, and the valuable character of the information they contain. These have been supplemented by the many newspaper comments of highly favorable character. From this it is con-

cluded that the work of the bureau is being appreciated by the public. Distribution of the bulletins was also made at the different congresses held during the year. At these congresses a good deal of literature, prepared and printed by the bureau, was distributed by the delegates from this bureau to members of the congresses and to prominent citizens of the towns and cities wherein they were held. The titles of these pamphlets are:

Horticulture and Agriculture in New Mexico, Climate is Fate, Mines and Minerals of New Mexico, New Mexico. New Mexico Health Resorts, and bulletins descriptive of each and every county in the Territory.

Hundreds of copies of the Report of the Governor of New Mexico to the Secretary of the Interior upon New Mexico affairs, for the years 1901 and 1902, were also among the literature so distributed and given away at these congresses and expositions. Hundreds of copies of the publications of the bureau and of the Report of the Governor of New Mexico for the years 1901 and 1902 have also been sent to the public libraries and educational institutions in the principal cities and towns of the United States, where they are kept for reference and where this bureau is informed they are proving of great interest and benefit.

The bureau is now at work gathering mineral specimens from all sections of the Territory for the purpose of making a creditable exhibit at the Louisiana Purchase Exposition, in 1904. Mining men throughout the Territory are being addressed and are asked for specimens to be sent to the bureau. When received they will be labeled, carefully packed, and arranged to be sent to St. Louis for the purpose above indicated.

Much material information and data have been gathered for the purpose of printing bulletins and pamphlets to be distributed at the World's Fair Exposition at St. Louis in 1904; photographs are being obtained and cuts of the same are being made for the purpose of illustrating such pamphlets and bulletins during the coming fiscal year, as prescribed by the act of the legislative assembly; the bulletins are to be printed and to be ready for the opening of the exposition in May, 1904. Every United States Senator and every member of the House of Representatives of the Fifty-seventh Congress has been furnished with complete sets of the publications of the bureau, and many bureau officials at Washington have also been furnished the same. State universities and college libraries have been treated in the same manner.

The correspondence of the bureau is larger than ever before, and during the past year over 3,000 letters and applications for information concerning the Territory have been received and promptly answered, and in each case maps, bulletins, and pamphlets descriptive of New Mexico—all containing information upon the resources, conditions, climate, inhabitants, public schools, mines, agriculture, horticulture, timber, stock, commercial, manufacturing, and other industrial interests—have been prepared and sent out; also articles have been sent to newspapers throughout the country which have published them, thus giving New Mexico a great deal of the very best advertising at an inconsiderable expense compared with the good this has done the Territory.

I am of the opinion that the time has come for the extension of the scope of the work of the bureau. The gathering of statistics of all industrial, agricultural, horticultural, mining, and labor matters should be made a part of the work and full authority for such work be given the bureau by law. Such information, carefully collected, arranged, and published once a year, would doubtless prove of great benefit to the Commonwealth and would be in line with modern progress and ideas.

All indications point to the fact that owing to the efforts of the bureau more capitalists, health seekers, tourists, and home seekers have come to New Mexico during the years 1902-3 than ever before in its history, and that many persons who finally made their permanent home in the Territory were brought here by the information scattered broadcast over the Union in the publications of the bureau. In addition the bureau has sent specimens of minerals and of agricultural products to the several congresses and expositions during the year, where they have attracted much attention and favorable comment, receiving many flattering newspaper notices.

The members of the bureau are receiving no compensation, but are only allowed traveling expenses upon actually attending meetings of the bureau. The appropriation for the maintenance of the bureau being very limited, but very few meetings were held, and during the past year but two meetings have been convened. In addition to giving their services free, the members of the bureau do considerable work in answering inquiries and letters and forwarding the same to the secretary, sending out bulletins and obtaining printed matter, and in gathering statistical and other information necessary and beneficial for the proper conduct of the affairs of the bureau. Thousands of bulletins have been distributed by the members of the bureau, and special good work in that direction has been done by Hon. Granville Pendleton, vice-president of the bureau, who has spent hundreds of dollars during

the past year out of his own means in advertising his home county, namely, San Juan. The members of the bureau are certainly entitled to the thanks of the people of the Territory for their unselfish labors for the advancement and prosperity of the people of the Territory.

The population of the Territory, according to the most reliable information, has largely increased during the year just closed, and specially in the counties of Roosevelt, Chaves, Eddy, Leonard Wood, Otero, and Quay. There is also considerable of an increase in eastern Valencia County. The eastern portion of the Territory is growing more rapidly than any other part on account of the recently constructed railroads in that section. The Estancia Plains in eastern Valencia County, through which the new Santa Fe Central Railway runs, are attracting much attention, and homesteaders in considerable numbers are going there. As the lines of the public survey have not yet been extended over that section, the settlement and the entrying of land there under the homestead laws are greatly retarded.

Reports from every incorporated city and town in the Territory show that these are constantly increasing in population, the town of Roswell, the county seat of Chaves County, having made the largest and most substantial growth. The map of the Territory is changing constantly, the last legislative assembly, in March, 1903, having created five new counties, four of which, namely, those of Roosevelt, Leonard Wood, Quay, and Sandoval, have been completely organized and in full force and existence, and the fifth, Torrance, will be organized and brought into being January 1, 1905.

In these new counties especially new towns are springing up, new precincts and school districts are being organized, and in every way much advancement is noticeable. At a very conservative estimate the population of the Territory has increased during the year just closed between 15,000 and 18,000 persons. The bureau of immigration, judging by its past experience, could very easily and with great benefit to the Territory use 2,500 copies of the annual report of the governor of New Mexico to the Secretary of the Interior. It is found that the demand for these valuable reports is very great, and that the 500 copies heretofore purchased by the bureau annually from its own funds are sent out within a few months. The bureau has received many letters commendatory of the excellent and valuable character of these reports and has found them to be one of the best to send to those desiring information concerning New Mexico, intending settlers, and homesteaders.

REPORT OF THE TERRITORIAL BOARD OF HEALTH.

By B. D. BLACK, *Secretary.*

RECEIPTS.

Fees from applicants for licenses		$275.00

DISBURSEMENTS.

Balance due W. G. Hope	$33.50	
Amount due W. G. Hope for postage, etc	4.60	
Remitted treasurer	275.00	
		313.10
Balance due W. G. Hope		38.10
Fees from applicants for medical licenses		600.00
Fees from applicants for undertaker's license		225.00
Fees from itinerant licenses		150.00
Remitted treasurer		975.00

REPORT OF THE BOARD OF DENTAL EXAMINERS.

By CHAS. N. LORD, *Secretary.*

The annual meeting of the board was held in the office of the secretary April 17 and 18, 1903. There were present L. H. Chamberlin, F. E. Olney, and C. N. Lord, whose term expired at the close of the last legislature, W. H. White and A. A. Bearup being absent, C. N. Lord having been appointed to fill the unexpired term of D. W. Manley, deceased. There were eight applicants for registration, graduates of colleges recognized as reputable by the National Association of Dental Examiners. Three of these were granted permanent certificates. Permanent certificates could not be granted to the other five at this meeting, as temporary certificates had been issued by D. W. Manley and diplomas submitted to him, therefore the issuing of these permanent certificates was left over until the next regular meeting, before which time inquiry could be made and diplomas examined by the present board.

No violation of the law was reported during the present year.

The old board adjourned and the new board immediately convened, with the following members present: L. H. Chamberlin, F. E. Olney, E. L. Hammond, and C. N. Lord, A. A. Bearup being absent. L. H. Chamberlin was elected president and C. N. Lord secretary and treasurer.

RECEIPTS.

Received from eight applications for registration	$40.00
Cash with treasurer	105.85
	145.85

EXPENDITURES.

L. H. Chamberlin, traveling expenses	26.20
F. E. Olney, traveling expenses	26.05
E. L. Hammond, traveling expenses	16.05
C. N. Lord, expenses	12.00
Engrossing and issuing three certificates	3.00
New Mexican Printing Company	14.00
Typewriting annual report	1.00
Cash with treasurer	47.55
	145.85

REPORT OF THE BOARD OF PHARMACY.

By A. J. FISCHER, *Secretary.*

Since last report the board has held two meetings, the first at Albuquerque, October 17 and 18, 1902, and the last at Santa Fe, March 9 and 10, 1903.

At the meeting held in Albuquerque the following applicants were examined: John T. Stark, of Roswell, and Charles E. Mead, of Las Vegas. Mr. Stark passed the examination and was granted a certificate as a registered pharmacist, and Mr. Mead was granted a temporary certificate, to expire at the next meeting of the board. Mr. W. G. Hodge, of Alamogordo, was also granted a temporary certificate on the same conditions.

Mr. B. Ruppe was reelected president and Mr. W. C. Porterfield secretary and treasurer for the ensuing year. The report of the secretary and treasurer was approved.

At the meeting held in Santa Fe, March 9 and 10, the following applicants were examined: W. D. Pratt, of Las Vegas; C. E. Mead, of Las Vegas, and George Wehrly, of Albuquerque. W. D. Pratt and C. E. Mead successfully passed the requirements of the board and were granted certificates as registered pharmacists; George Wehrly was granted a temporary certificate, to expire at the next meeting of the board.

The board formulated an amendment to the pharmacy law, which was duly passed by the legislature. The committee on complaints and grievances reported that T. W. McSchooler, of Folsom, was violating the provisions of the pharmacy law, and Mr. E. G. Murphy was instructed to investigate and report findings to the board.

The reappointment of Mr. E. G. Murphy as a member of the board for five years from March 19, 1902, was noted. Appended hereto is a list of the registered pharmacists in New Mexico to this date, also financial statement of secretary and treasurer.

On April 20, 1903, Mr. W. C. Porterfield tendered his resignation as secretary and treasurer, same to take effect at once, and President Ruppe appointed A. J. Fischer secretary and treasurer until the next meeting of the board.

Copy of register.

Name.	Address.	Name.	Address.
Agee, S. W	Silver City.	Hodge, J. R	Roswell.
Arnold, J. J	Central, Colo.	Hubard, J. R	Northfork, W. Va.
Bowman, Alex	Farmington.	Hoffman, C. O. F	Carlsbad.
Becker, John	Belen.	Hay, J. M	Las Vegas.
Borrodaile, W. M	Magdalena.	Hayes, H. B	San Marcial.
Byron, Ralph	Deming.	Hamilton, J. J	Cerrillos.
Bohn, C. H	Philadelphia.	Hunter, E. R	
Beeson, C. T	Fierro.	Ireland, A. C	Santa Fe.
Buchofsky, T. M	Silver City.	Irvine, J. E	Deming.
Briggs, B. H	Albuquerque.	Jackson, W. L	Silver City.
Bell, E. M	Carlsbad.	Jones, V. H	Alamogordo.
Buck, C. W	Moulton, Iowa.	Jacobson, J. L	Silver City.
Conklin, J. P	Albuquerque.	Johnson, J. V	
Christensen, C	Las Vegas.	Kinnear, J. A	Deming.
Condit, E. G	Aztec.	Kremis, W. H	Springer.
Crawford, L. B	Albuquerque.	Kinsinger, E. D	Roswell.
Charlton, N. E	Clayton.	Kemper, W. J	Denver.
Driscoll, Wm	Socorro.	Kilgore, E. B	Albuquerque.
Dewey, S. N	Albuquerque.	Lane, A. G	White Oaks.
Ellis, F. C	Santa Fe.	Laudenslager, A. E	Santa Fe.
Fischer, A. J	Do.	Lane, H. B	Las Cruces.
Forsythe, J. R	Albuquerque.	Lane, B. E	Do.
Freeman, Bliss	Las Cruces.	Luckritz, H. E	Chicago, Ill.
Forbes, W. A	Las Vegas.	Murphey, E. G	Las Vegas.
Goodall, K	Do.	Mallette, J. R	Albuquerque.
Goebel, O	Belen.	Miller, C. C	Hillsboro.
Grindle, M. R	Raton.	Moreno, P	Las Cruces.
Givens, F. I	Hillsboro.	Myrhe, O. G	Silver City.
Howells, A. E	Socorro.	Moore, S. G	Roswell.
Howard, John	Deming.	Maghee, H. G	Albuquerque.
Huber, S	Denver.	Markham, A. J	Las Vegas.
Hilton, Mrs. E. K	Socorro.	Miller, J. A	Danville, Ill.

Copy of register—Continued.

Name.	Address.	Name.	Address.
Moore, T. B	Tucumcari.	Salisbury, H. L	Raton.
Mead, C. E	San Marcial.	Small, W. H	Lordsburg.
McNatt, E. E	Roswell.	Schaefer, O. G	Las Vegas.
McMahon, J. P	Salida, Colo.	Schmaalmach, F. W	Albuquerque.
McCracken, M	Farmington.	Sanders, I	Trinidad.
Nowers, L. E	Douglas, Ariz.	Smith, A. R	Carlsbad.
Nisbet, R. J	San Marcial.	Slack, J. C	Clayton.
Ney, M. C	Albuquerque.	Schrichte, J. H	Carlsbad.
Orton, L. S	Taos.	Stark, J. T	Fort Worth.
O'Rielly, J. H	Albuquerque.	Smith, S. W	Ansonia, Conn.
Porterfield, W. C	Silver City.	Tomlinson, J. A	Tucumcari.
Porterfield, M. W	Do.	Thomas, J. C	Santa Rosa.
Pruitt, F. E	Farmington.	Tigner, R. M	Roswell.
Pring, E. J	Tucumcari.	Van Patten, H. S	Las Vegas.
Payton, B. D. W	Roswell.	Vincent, E. D	Do.
Paden, M. G	White Oaks.	Winters, D. C	Do.
Priest, E. C	Rincon.	Wegman, M	Chloride.
Packert, H. M	Albuquerque.	Woodward, W. M	Raton.
Pratt, W. D	Las Vegas.	Watson, T. W	Albuquerque.
Ruppe, B	Albuquerque.	Walton, W. Y	Do.
Relling, A. H	Silver City.	Williams, G. B	Do.
Robinson, L. B	Pinos Altos.	Warren, W. E	Alamogordo.
Roland, F. C	Alamogordo.	White, M. M	Clayton.
Roseberry, H. E	San Marcial.	Waring, T. A	Gallup.
Reinert, L. F	Keystone, W. Va.	Zook, J. N	Santa Fe.
Schroeder, J. B	Raton.	Zimmerman, J. J	Ruston, Iowa.

Financial statement.

RECEIVED.

Balance on hand, as per report August 31, 1902	$235.19
Amount received for registrations and renewals to date of this report	406.06
	641.25

DISBURSED.

1902.			
Aug. 13.	Postage	$5.00	
29.	B. Ruppe, committee on complaints	50.15	
Oct. 14.	Postage	5.00	
18.	B. Ruppe, per diem	10.00	
18.	A. J. Fischer, per diem and mileage	16.10	
18.	W. C. Porterfield, per diem and mileage	37.00	
Nov. 11.	Express on certificate	.25	
13.	Printing, Walton	15.00	
1903.			
Jan. 6.	Typewriter paper and carbon	3.00	
	Letter files and envelopes	2.00	
18.	Printing, Independent Publishing Company	17.00	
Feb. 21.	Postage	5.00	
26.	Telegram	.40	
26.	Postal cards and paper	2.00	
Mar. 10.	B. Ruppe, per diem and mileage	31.90	
10.	A. J. Fischer, supplies, per diem, and mileage	29.75	
10.	E. G. Murphey, per diem and mileage	21.05	
10.	W. C. Porterfield, per diem and mileage	55.50	
Apr. 21.	Postage	5.00	
21.	Express prepaid on books sent to A. J. Fischer	2.20	
21.	Assistant to secretary	59.95	
27.	Postage	5.00	
May 6.	Letter files	.25	
6.	Ledger	.75	
6.	Ribbon	.25	
15.	Postage	5.00	
25.	Postage	5.00	
30.	Typewriter supplies	6.60	
July 7.	Printing, stationery, and blanks	29.25	
			425.35
	Balance cash on hand		216.90

REPORTS OF HOSPITALS.

ST. VINCENT'S HOSPITAL AND ORPHANAGE, AT SANTA FE.

[Conducted by the Sisters of Charity.]

Patients in hospital June 30, 1902	30
Patients received during the year	154
Patients dismissed	85
Patients died	11
Patients in hospital June 30, 1903	69
Total number of days	6,230

Financial statement.

Territorial appropriation	$3,392.06
Pay patients	668.25
Donations	40.00
Accounts payable	825.69
Total	4,926.00

ST. VINCENT ORPHANAGE.

Children in orphanage June 30, 1902	64
Children received during the year	41
Children taken by parents and guardians	24
Children died during the year	0
Children in orphanage June 30, 1903	81

Financial statement.

Territorial appropriation	$5,070.68
From relatives and friends	425.32
	5,496.00
Disbursements	4,507.79
Balance on hand	988.21

ST. JOSEPH'S SANITARIUM, AT ALBUQUERQUE.

[Conducted by the Sisters of Charity.]

Charity patients treated	121
Days treated	3,144
Pay patients treated	461
Days treated	8,562
Patients dismissed	481
Patients died	63
Patients in hospital June 30	38
Cash received from pay patients	$15,675.72
Cash received from bazaar	2,204.32
Cash received from appropriation	1,225.01
Cash received from donations	589.81
	19,694.86
Paid out	19,666.97
Balance on hand June 30, 1903	27.89

ST. JOSEPH'S HOSPITAL, SILVER CITY.

Patients admitted	56
Days in hospital	1,417
Patients discharged	43
Patients died	9
Patients in hospital June 30, 1903	4
Receipts for year ending June 30	$1,410.43
Expenditures for the year ending June 30	1,514.53

Amount for last month, $104.10, not yet received from the treasurer.

GRANT COUNTY CHARITY HOSPITAL.

By MRS. F. E. GILL, *Secretary.*

RECEIPTS.

From Territory	$909.76
From pay patients	1,333.75
From other sources	135.70
Discount	22.35
By balance	460.73
	2,862.29

DISBURSEMENTS.

Groceries	$868.91
Drugs	75.45
Fuel and light	233.56
Laundry	121.67
Matron fund	60.00
House furnishing	143.25
Telephone	36.00
Insurance	30.00
Ice	18.95
Printing	18.50
Salaries	1,256.00
	2,862.29

Pay patient report.

Number treated	52
Number died	7
Days treated	906

Charity patient report.

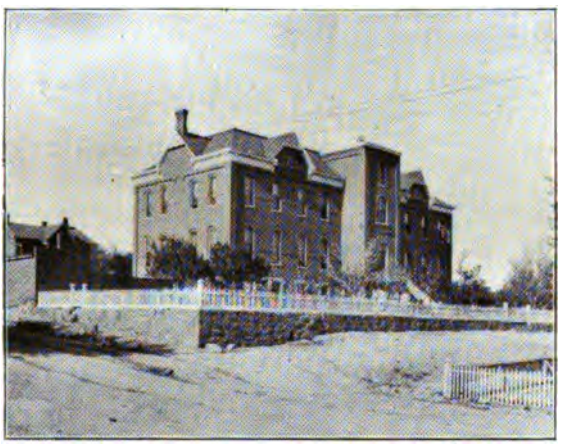
Number treated	16
Number died	1
Days treated	1,120

LADIES' HOSPITAL AT DEMING.

[LOU H. BROWN, *Treasurer.* KATE BYRON, *Secretary.*]

June 30, 1902.	Balance on hand		$270.60
Oct. 20, 1902.	Received from Territorial auditor, warrant No. 8827 on treasurer of Territory	$304.47	
Dec. 24, 1902.	Received from Territorial auditor, warrant No. 8931 on treasurer of Territory	145.25	

ST. ANTHONY'S SANITARIUM AT LAS VEGAS.



SISTERS OF MERCY HOSPITAL AT SILVER CITY.

Mar. 21, 1903.	Received from Territorial auditor, warrant No. 9109 on treasurer of Territory	$357.44	
	Received from secretary of hospital	61.50	
	Total amount received		$868.66
			1,139.26
	Paid out from June 30, 1902, to June 30, 1903, as per 75 warrants on treasurer of Ladies' Hospital, numbered from 398 to 472, signed by the secretary and the president		1,088.14
June 30, 1903.	Balance on hand		51.12

Patients treated	54
Patients died	4
Patients discharged	48
Patients in hospital	2

EDDY COUNTY HOSPITAL.

By MARY J. KERR, *President.*

According to the treasurer's report, a copy of which is attached hereto, this association has received during the year ending June 30, 1903, from all sources, the sum of $1,309.27; $659.88 of this sum was received from the Territory in warrants, as set out in said report. As will appear from said treasurer's report, $971.52 has been expended by the association in the care of patients and $345.77 has been paid on the hospital building, which completes the payment of the purchase price of the property.

We therefore take pleasure in reporting at this time that the association now owns, free and clear of all indebtedness, the hospital building with room therein for taking care of 10 patients.

The property is worth at the present time about $3,500.

During the past year 33 patients have been taken care of, and the average time per each patient has been slightly over 17 days. The total number of days for all of the 33 patients was 565, which shows that it has cost the association $1.72 per day each for the care of the patients, which is something less than the average cost for the fiscal year ending June 30, 1902. The association has been somewhat disappointed with reference to the amount of money received from the Territory during the last year, as an examination of the treasurer's report for last year shows that the association received from the Territory $1,031.06 during the fiscal year ending June 30, 1902, or $371.18 more than the amount received during the year ending June 30, 1903. As a result the association has had to draw all of the balance left over from last year, and use practically all of the funds secured from membership fees, donations, etc., to pay for the care of patients, and it has found itself without funds with which to make some necessary repairs and improvements in the building.

It is confidently hoped by the association that the taxes will be paid in shortly, so that the auditor will be able to distribute to it something like the amount we expect to receive from the appropriation made for its benefit by the legislature. We have no doubt, of course, that up to the present time the taxes have not been collected and turned in to the Territorial treasurer; otherwise warrants would have been sent to our treasurer for the same.

Taking all things into consideration, the association feels that it has passed through another successful year, in that it has been able to afford relief and comfort to many afflicted persons who would have otherwise received no care or attention, and in many cases not only have the sufferings of human beings been alleviated, but lives have been saved.

I, J. O. Cameron, treasurer, hereby submit the following annual report:

RECEIPTS.

1902.		
July 1.	Balance from last report	$200.76
Aug. 14.	Cash from Francis La Casse	5.00
20.	Territorial warrant No. 8736	77.05
20.	Eddy County warrant	2.40
Sept. 6.	Cash returned by Mrs. Hutchinson	25.00
9.	Miles Stone, patient	11.00
15.	Territorial warrant No. 8785	91.60

Oct. 6.	Geo. Wilcox, patient	$5.00
16.	Territorial warrant No. 8819	65.25
Nov. 11.	Territorial warrant No. 8858	63.58
Dec. 19.	Cash from Miss Brown, account of patient	5.00
29.	Territorial warrant No. 8923	79.62
1903.		
Jan. 7.	Cash from Miss Danforth, patient	6.00
7.	Cash from Mrs. Smith, patient	14.00
Feb. 2.	Territorial warrant No. 8965	80.01
2.	Cash from Eddy County	30.00
5.	Cash, Mr. Bobo	15.00
	Chas. Watson, patient	4.00
	Mr. Galvan, patient	6.00
	Proceeds Skaggs's entertainment	9.50
11.	Membership fees	64.00
19.	Membership fees	12.25
21.	Cash from Miss Hendy, patient	14.00
	Mr. Alexander, patient	9.00
21.	Territorial warrant No. 9057	119.50
Mar. 9.	Cash from minstrel entertainment	31.38
20.	Cash from Pecos Valley and Northeastern Railway Company, donation	40.00
23.	Cash, Mrs. Handie, patient	20.00
23.	Cash, Mr. Kinsen, patient	4.50
23.	Territorial warrant No. 9092	83.27
30.	Cash from Pecos Irrigation Company, care patient	28.50
May 5.	Cash from Mrs. Phillips, patient	5.00
5.	Eddy County warrant	42.60
28.	Cash for care of Ed. Collins, patient	30.00
June 1.	Cash, Mrs. Howtower, patient	4.50
11.	Cash, J. M. Murray, patient	6.00
	Cash, Harry Kayser, patient	9.00
	Total receipts	1,309.27

RECAPITULATION.

Received from Territory	$659.88
Membership fees	76.25
Patients	191.50
Eddy County	75.00
Donations	40.00
Proceeds of entertainments	40.88
Return of cash advanced to Mrs. Hutchinson	25.00
Balance in treasury July 1	200.76
Total	1,309.27

DISBURSEMENTS BY WARRANTS.

No. of warrant.		No. of warrant.	
318	$9.90	343	$2.00
327	2.00	344	35.00
328	5.50	345	5.00
329	6.80	346	1.50
330	15.00	347	33.25
331	1.25	348	6.25
332	1.50	349	5.00
333	40.00	350	1.35
334	35.00	351	2.40
335	3.00	352	18.00
336	4.00	353	5.00
337	6.10	354	7.30
338	2.50	355	2.00
339	2.00	356	35.00
340	1.50	357	5.50
341	7.20	358	6.50
342	7.40	359	11.80

No. of warrant.	
360	$4.00
362	1.50
362a	35.00
363	5.00
364	1.35
365	1.85
366	1.95
367	7.77
368	4.50
370	9.70
371	2.50
372	35.00
373	5.00
374	1.00
375	6.00
376	26.20
377	.96
378	.85
379	24.55
380	35.00
381	5.35
382	4.50
384	1.70
385	4.00
387	14.00
388	1.15
390	18.70
391	40.60
392	6.70
393	2.00
10	5.10
11	28.87
12	$17.10
13	13.00
14	40.50
15	27.27
16	12.25
17	2.00
18	4.15
19	35.70
20	10.50
22	1.50
23	1.15
24	40.60
25	2.00
29	4.90
31	2.30
32	17.00
33	40.00
34	3.00
369	4.00
386	5.70
389	5.05
Total	965.52
Paid at request of president without warrant	6.00
July 12, 1902, paid on hospital property to Mrs. Farwell	100.00
February 5, 1903, paid balance due on hospital property to Mrs. Farwell	245.77
Total	1,317.29

RECAPITULATION.

Paid on account of care of patients	$971.52
Paid on account of purchase of hospital building	345.77
Total	1,317.29

Thus leaving an overdraft at the S. T. Bitting bank for the difference between the two amounts of $8.02 on July 1, 1903.

A STATISTICAL SYNOPSIS OF THIS REPORT.

NEW MEXICO FACTS AND FIGURES.

Area: 122,469 square miles.

Population: 284,000; census of 1900, 195,310; 1890, 153,593; 1880, 119,565; 1870, 91,874; 1860, 87,034; 1850, including Arizona and southern Colorado, 61,547, which area now has over 400,000 inhabitants. Of the present population 144,000 came from the States or are children of parents from the States; 127,000 are of native descent; 13,000 are Indians. Of the 66,396 wage-earners in the census year of 1900, 40 per cent, or 27,214, were engaged in agricultural pursuits, 19,478 in domestic service, 10,378 in manufacturing, mining, and mechanics, 7,208 in trade, and 2,118 in professional service.

FARMS AND FARM PRODUCTS.

Number of farms, 1890, 4,458; in 1900, 11,834. Acres in farms in 1890, 787,882; in 1900, 5,130,878. Value of farms in 1890, $33,543,141; in 1900, $53,737,824. Value of farm lands, 1890, $8,140,800; 1900, $20,888,824. Value of farm implements, 1890, $291,140; 1900, $1,151,610. Value of live stock, 1890, $25,111,201; 1900, $31,727,400. Value of farm products, 1890, $2,000,000; 1900, $10,000,000. Acres in alfalfa, 1890, 12,139; 1900, 55,467. Acres under culture, 1890, 91,745; 1900, 203,893. Butter, 1890, 105,000 pounds; 1900, 381,000 pounds. Eggs, 1890, 280,000 dozen; 1900, 840,000 dozen. Hay, census of 1900, $1,427,317. Cereals, 1900, $979,903. Vegetables, 1900, $278,413. Orchards, 1900, $197,331. Other products, 1900, $374,537. Acres under irrigation, 326,873. Improved farms, 1900, 12,311. Farms under irrigation, 9,128. Value of irrigated farms, $13,551,592. Value of nonirrigated farms, $3,773,177.

The above statistics do not take into consideration the lands cultivated by the Indians, the Pueblos being farmers and great producers of crops; nor of crops raised on farms of less than 3 acres, of which there are many thousand in New Mexico.

CLIMATE.

The weather bureau at Santa Fe reports for that point during 1902 twenty-five cloudy days out of 365; 81 per cent of sunshine; a maximum velocity of the wind of 42 miles an hour and an average velocity of 6.9 miles an hour; an annual mean temperature of 50.2°; a maximum temperature of 91°; a minimum temperature of 8°; a precipitation of 13.36 inches; a maximum monthly precipitation of 2.49 inches; a minimum monthly precipitation of 0.02 of an inch.

PUBLIC LANDS.

Subject to entry under the Federal land laws on June 30, 1903, 52,000,000 acres. Included in the four forest reserves, 5,125,000 acres. In land grants approved by Congress, 9,963,200 acres; by the Court of Private Land Claims, 1,900,945 acres. The land grants approved by Congress include 549,065 acres to the Indians.

Public land entered from June 30, 1900, to June 30, 1903, 2,179,738 acres. From June 30, 1900, to June 30, 1901, 655,739.54 acres; June 30, 1901, to June 30, 1902, 441,871 acres; June 30, 1902, to June 30, 1903, 1,082,128 acres.

Homesteads entered from June 30, 1900, to June 30, 1903, 1,120,477 acres; from June 30, 1900, to June 30, 1901, 265,524 acres; from June 30, 1901, to June 30, 1902, 386,757 acres; from June 30, 1902, to June 30, 1903, 468,196 acres.

Desert-land entries, June 30, 1900, to June 30, 1903, 129,595 acres; from June 30, 1900, to June 30, 1901, 8,472 acres; from June 30, 1901, to June 30, 1902, 46,596 acres; from June 30, 1902, to June 30, 1903, 74,585 acres.

MINERAL PRODUCTION.

From 1860 to 1900 New Mexico produced $17,600,000 worth of gold. In 1903 New Mexico produced: Gold, $384,685; silver, $148,659; copper, $860,737; lead, $94,936; a total of $1,489,016. This does not include the production by individual placer miners or by prospectors not mining in a systematic manner. In addition, New Mexico produced a vast quantity of coal, iron, turquoise, gypsum, building material, and a number of other useful minerals and precious stones. The Colorado Fuel and Iron Company during the fiscal year hauled 138,152 long tons of iron ore out of New Mexico. The Director of the Mint reports that during 1902 New Mexico produced $531,131 of gold and $591,137 of silver.

COAL.

Area of prospected coal lands, 1,493,480 acres; amount of coal in sight, 8,813,840,000 tons, valued at $10,000,000,000. Coal produced from June 30, 1900, to June 30, 1903, 3,710,004 tons, valued at $5,011,281.70. Coke produced in those three years, 94,097 tons, valued at $252,642. There were 28 coal mines worked during the past year; 3 new mines were opened, 1 resumed, and 2 were abandoned. Coal produced from June 30, 1900, to June 30, 1901, 1,217,530 tons, valued at $1,606,174; from June 30, 1901, to June 30, 1902, 1,132,944 tons, valued at $1,609,848.90; from June 30, 1902, to June 30, 1903, 1,359,530 tons, valued at $1,795,208.80. Coke was produced as follows: From June 30, 1900, to June 30, 1901, 42,732 tons, valued at $117,516.25; from June 30, 1901, to June 30, 1902, 25,012 tons, valued at $58,207; from June 30, 1902, to June 30, 1903, 26,353 tons, valued at $76,919. Men employed in the coal mines June 30, 1901, 1,870; June 30, 1902, 1,682; June 30, 1903, 2,341.

POLITICAL.

Votes cast at the November election, 1900, 39,414, of which the Republicans received 21,557 and the Democrats 17,857. To the legislature were elected that year 9 Republicans and 3 Democrats in the

council and 20 Republicans and 4 Democrats to the house. The vote cast in November, 1902, was 38,798. of which the Republicans received 24,222 and the Democrats 14,576, twenty counties giving Republican majorities and four Democratic. To the legislature were elected 12 Republicans and no Democrat to the council and 22 Republicans and 2 Democrats to the house.

RAILROADS.

There were 1,679 miles of railroad in New Mexico on June 30, 1900: 1,981 miles on June 30, 1901; 2,263 miles on June 30, 1902; 2,520 miles on June 30, 1903, a total increase in three years of 841 miles.

STOCK.

New Mexico has 1,123,000 head of cattle; 5,674,000 head of sheep; 113,000 head of goats; 97,500 head of horses. Its wool crop in 1902 was 22,000,000 pounds. During the fiscal year there were shipped out of the Territory 184,602 head of cattle, 5,526 horses, 17,275 hides, and 422,252 head of sheep.

INTERNAL REVENUE.

From June 30, 1900, to June 30, 1903, New Mexico paid $130,375.11 in internal revenue; for the year ending June 30, 1903, $33,918; for the year ending June 30, 1902, $37,847.80; for the year ending June 30, 1901, $58,609.31.

INCORPORATIONS.

In the past three fiscal years 553 companies filed incorporation papers, with a capitalization of $309,711,966, with the Territorial secretary. In the fiscal year ending June 30, 1901, 149 companies incorporated, with a capital stock of $89,735,925; in the fiscal year ending June 30, 1902, 204 companies incorporated, with a capitalization of $119,446,500; in the year ending June 30, 1903, 200 companies incorporated, with a capitalization of $100,529,541.

ASSESSMENT.

In 1900 the Territorial assessment, subject to taxation, was $36,364,761.16; in 1901 the Territorial assessment was $36,977,047.94; in 1902 the assessment was $38,633,993.27; in 1903 the assessment was $41,832,566.79 including exemptions amounting to $2,235,615, leaving an assessment subject to taxation of $39,596,951.79. Property in New Mexico is assessed at an average of only 20 per cent of its real value.

INDEBTEDNESS.

On June 30, 1901, the indebtedness of the Territory was $1,180,800; on June 30, 1902, it was $1,123,300 and the sinking fund $89,246.26; on June 30, 1903, the indebtedness was $1,098,300 and the indebtedness sinking fund $134,590.03. This is a reduction of $270,090 in three years.

TAXES COLLECTED.

Revenue of the Territory the past three years, $1,545,241.37, of which $1,127,689.18 came from direct taxation; $419,622.06 collected during the fiscal year ending June 30, 1903; $332,328.85 collected during the fiscal year ending June 30, 1902, and $375,738.27 for the fiscal year ending June 30, 1901. From other sources Territorial revenue was derived to the amount of $407,542.19, $142,758.22 being received during the fiscal year ending June 30, 1901; $118,005.17 during the year ending June 30, 1902, and $156,788.80 during the year ending June 30, 1903.

Federal appropriations for disbursement in New Mexico during the fiscal year ending June 30, 1903, $423,070.

Territorial tax rate, 1900, 14.05 mills; 1901, 14.29 mills; 1902, 13.99 mills.

INSURANCE COMPANIES.

During the past three fiscal years insurance companies authorized to do business in New Mexico collected in premiums $1,998,444.87, and paid out for losses $672,415.50. Life insurance companies wrote in those three years policies amounting to $6,552,669.61; fire insurance companies, $39,233,614.19, and miscellaneous insurance companies, $5,246,885.12; a total of $51,033,168.92. During the fiscal year ending June 30, 1903, there were written in New Mexico life insurance policies amounting to $3,095,854, fire insurance policies to the amount of $15,549,968, miscellaneous policies to the amount of $2,916,414.08, and premiums collected to the amount of $766,389.44; while the year previous $655,015.27 was collected in premiums, and the year previous to that, $577,039.66; losses paid during the past fiscal year, $251,342.43; the year previous, $234,236.36, and the year previous to that, $186,836.71.

WELLS FARGO EXPRESS COMPANY.

Revenue on intrastate business during the fiscal year ending June 30, 1903, $32,971.55; the year ending June 30, 1902, $30,884.28; the year ending June 30, 1901, $27,313.63.

PUBLIC BUILDINGS AND GROUNDS.

The Territory maintains 15 Territorial institutions, the value of whose buildings and grounds is $2,000,000, without the grants of land made to them by Congress. In addition the Territory grants subsidies to seven hospitals and an orphan asylum maintained by religious and charitable organizations. The value of the public school property of the Territory is $690,697.91, not counting the school sections in each township. The value of the public property of counties and towns, not counting grants to towns like Santa Fe, Las Vegas, Socorro, etc., is $495,000, making a total value of public property, not including lands, of $3,185,697.91.

EDUCATIONAL.

School population, 1903, 68,152; 1902, 62,864; 1901, 53,008. The school population includes all children between the ages of 5 and 21 years, and the census is taken annually.

Enrollment in the public schools, 1903, 37,646; 1902, 35,227; 1901, 31,510; 1900, 21,761.

Average daily attendance, 1903, 24,856; 1902, 22,573; 1901, 19,451.

Public schools, 1903, 665; 1902, 603; 1901, 599.

Teachers, 1903, 757; 1902, 712; 1901, 671.

Expenditures, 1903, $287,545.02; 1902, $324,784.91; 1901, $202,882.53.

Receipts from all sources, 1903, $454,342.38; 1902, $424,365.42.

Average school term, four months; average salary paid teachers, $56 a month; total value of all school property in the Territory, $2,071,702.25; enrollment of pupils in all of the schools, 42,925; annual expenditures for all of the schools, $723,048.32; total expended for the public schools the past three years, $815,212.46.

CHURCHES.

The Roman Catholic Church in New Mexico has 1 archbishop, 1 bishop, 1 vicar-general, 16 regular priests, and 43 secular priests. It has 42 churches with resident priests, 325 mission churches, 6 academies for young ladies, 1 college, 8 parochial schools, 2 boarding schools for Indians, with 300 pupils; 2 day schools for Indians, with 200 pupils; 2 academies for boys.

Baptist Churches 36, of which 4 became self-supporting during the past year, one college, and a number of mission schools.

Lutheran Churches 3.

Methodist Episcopal, 17 English-speaking congregations, a number of Spanish-speaking churches, and a number of mission schools.

Presbyterian, 45 congregations, 30 preaching stations, 25 mission schools taught by 45 teachers, and an enrollment of 1,562 pupils.

Mormons, 2 churches, with 277 souls. A few scattered members in addition at Bloomfield and Plainfield.

The Christian Church and other Protestant denominations have about 20 congregations in the Territory. The Hebrews have a synagogue at Las Vegas and Albuquerque, and have church organizations in two or three of the larger cities.

NEWSPAPERS.

On September 15, 1903, there were 70 newspapers published in New Mexico, 5 of them daily, 60 weekly, and 5 monthly; in 1902, 65; in 1901, 67. Of late years many of the old newspapers have consolidated with newer papers, giving better news service, having larger subscription lists, and wielding greater influence than ever before. Each of the five daily papers has the complete Associate Press Service.

NOTARIES PUBLIC.

During the year ending June 30, 1903, 288 notaries public were appointed; during the year ending June 30, 1902, 205; during the year ending June 30, 1900, 202.

BANKS.

On June 30, 1903, there were 19 national banks and 11 State banks; June 30, 1902, 15 national banks and 11 State banks; June 30, 1901, 11 national banks and 9 State banks.

Resources: June 30, 1903, $10,696,449.31; June 30, 1902, $9,677,-165.82; June 30, 1901, $7,990,238.67. Capital stock: June 30, 1903, $1,439,200; June 30, 1902, $1,314,450; June 30, 1901, $1,103,919.16.

Deposits: June 9, 1903, in State banks, $1,764,815.21; in national banks, $5,675,594.78; total, $7,440,409.99; June 30, 1902, $7,455,530.08; June 30, 1901, $6,073,641.34. Loans and discounts: June 9, 1903, $5,803,697.64; June 30, 1902, $5,062,294.05; June 30, 1901, $4,110,-772.57. At this time of year considerable money is withdrawn from the banks to move the wool crops and stock.

POPULATION.

An estimate of the population of New Mexico on June 30, 1903, from registration and school-census returns: Males of voting age, 69,000; females of the same age, 68,000; children of school age, 68,000; foreigners not citizens, 5,000; Indians, 13,000; children under the age of 5, 61,000; total, 284,000.

CONCLUSION.

Those who read the preceding pages of this report with any degree of earnest desire to learn the truth regarding the natural riches of New Mexico need not be told that the possibilities of development in almost any branch of human endeavor are unsurpassed in extent, variety, and attractiveness. What we need to develop the mines, as well as the agricultural, stock growing, and other resources, is capital, and large fortunes are in store for those who have money and industry and the disposition to come and make their homes among as hospitable a people as the sun ever shone upon.

Every prediction made for prosperity early in the year is now in a fair way to be fulfilled, and the Territory will exceed almost all former yearly records in the amount of revenue derived from produce, sheep, cattle, and mines at the close of the year.

The progress and advancement of New Mexico is so rapid that between the time that this report is written and it is printed material changes occur, new mines being opened, new railroads built, new development made, and new towns founded, although the general conditions underlying this advancement are permanent.

Respectfully submitted.

MIGUEL A. OTERO,
Governor of New Mexico.

SANTA FE, N. MEX., *September 15, 1903.*

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